

COMPUTERWORLD

Giants spar over networked DBMSs

Microsoft, Borland aggressively court IS

By Jean S. Bozman
SAN FRANCISCO

Like two warring gods in ancient mythology, Microsoft Corp. and Borland International, Inc. are fighting to win over information systems managers looking to "upsized" their PC local-area network databases.

Each vendor is throwing lightning bolts in the form of feature-packed tools and aggressively low prices.

For example, to attract power users to a type of programming usually practiced by trained systems analysts, both Borland and Microsoft are providing many ease-of-use features.

Microsoft's Access has "wizards" and "cue cards" to prompt end users building database reports. The object-oriented development language in Borland's Par-

adox for Windows is also intended to expand the user base.

But winning IS loyalty could require a more direct, hands-on approach as corporations move to open systems, analysts said.

With that in mind, Borland and Microsoft have come calling at large user sites where they have already installed many products.

"The end-user community has been dying for a database for Windows applications. We're looking at both of their tool sets and seeing how they match into our plans," said Art Beckman, manager of information technology services at Pacific Gas & Electric Co. in San Francisco.

Sweeteners such as introductory prices of \$99 for Access and \$139 for the delayed Paradox for Windows [CW, Jan. 18] are supposed to gain IS managers' mind share when database servers are

Giants, page 14

Doubts grow over NT package, date

By Christopher Lindquist
REDMOND, WASH.

Windows NT is going to be either late or "lite," according to well-connected industry analysts and users queried last week.

In a scenario that is increasingly beginning to resemble the early days of OS/2, Microsoft Corp. appears to be struggling to determine not only how to present Windows NT but even what Windows NT will be in its first release.

While Microsoft still insists that Windows NT will ship in the second quarter with all promised functionality, analysts and users are betting that the new operating system will either have to be delayed as much as several months or stripped of some functionality to meet the scheduled ship date of May or June.

There are also reports that an NT product containing only client functionality — limited

networking — may be in the works for release before the full Windows NT shipment, something Microsoft vehemently denies.

What is apparent, based on the near unanimity of opinion by analysts and users, is that Microsoft still has something of a credibility gap to bridge. Despite Microsoft's strong statements to the contrary, observers still have doubts about the firm's ability to deliver on what it promises.

"The pattern that's shaping up is beginning to look a lot like OS/2," said Neal Hill, senior analyst/computing strategies at Forrester Research, Inc. in Cambridge, Mass.

IBM's experience with OS/2 2.0 included several slipped shipment dates and a final

product that contained less than the originally promised functionality.

Microsoft has already pushed back Windows NT's shipment date several times — from late 1992 to second-quarter 1993 — since announcing Windows NT, page 8

Microsoft will be
"hard-pressed to have
[Windows NT] out
by June."

— Craig Goldman,
Chief Information Officer,
Chase Manhattan Bank

Mapping the future

Industry looks to Clinton regime to accelerate technology highway

By Gary H. Anthes and Joanie M. Wexler

Now that a technology-savvy administration is settling into the White House, opinions abound as to what role the federal government should play in building a coast-to-coast electronic information highway — a pet project of Vice President Albert Gore.

The tumult of last week's inauguration did not stop Rep. Edward J. Markey (D-Mass.) from holding a congressional hearing to examine ways to unite warring factions such as newspaper publishers and local telephone companies behind a program to bring digital net-

Clinton, page 20



President Bill Clinton will face pressure from the high-technology industry to address the need for a nationwide electronic information highway.

Wal-Mart spotlights fast LANs

Retailer hopes to speed up store-to-supplier ordering

By Elisabeth Horwitt
BENTONVILLE, ARK.

Wal-Mart Stores, Inc. is counting on a high-speed, enterprisewide local-area network, slated for completion in April, to feed the bandwidth-hungry applications and business practices it hopes will keep it ahead of its retailing rivals throughout the decade.

The crux of the network is LAN Advantage, a product from Hughes Network Systems, Inc. that puts Hughes' very small-aperture terminals directly on Token Ring LANs installed at stores, warehouses and headquarters.

The network will boost transmission speeds of individual stores on Wal-Mart's enterprise backbone from about 19.2K bit/sec. to hundreds of thousands

of kilobit/sec., according to Michael Fitzgerald, special project manager of the retailer's network.

The faster connections are crucial, given that "we have a number of applications coming along, each of which has the need to move multiple gigabytes of data per day and from the stores," Fitzgerald said.

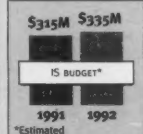
Among the more strategic of these applications are Wal-Mart's multiyear push toward direct store-to-supplier ordering as well as recent experiments with multimedia PCs as training vehicles.

The new direct LAN-to-satellite links will make file transfers go five to seven times faster and will speed up Unix server-to-IBM host interactions by as much as 50% — all without the need to replace Wal-

Wal-Mart, page 16

Bang for the buck

Wal-Mart's investment in information technology appears to be paying dividends



Source: CW Premier 100

Newspaper

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William Maender's advice: Don't sign an outsourcing deal without giving yourself a way to bail out. Page 57



NEWS

Industry heavyweights kicked off the new year with a bushel of bad financial news. A bedeviled IBM announced its biggest loss ever, glumly noting that its fortunes are unlikely to be reversed anytime soon. And a beleaguered Borland posted a startling \$63.1 million loss for the third quarter. One bright spot was Computer Associates, which revealed record revenue and earnings for its third quarter. *Pages 4, 14*

President Bill Clinton barely got through his inauguration before debate over nationwide telecommunications issues began. Chief on the list is the disposition of a super data highway. Also high on that to-do list is finding a replacement for the DOD's IS czar, Paul Strassmann, who resigned last week. *Pages 1, 10*

The battle for the desktop has moved into overdrive on both the operating system and database fronts. Microsoft is particularly busy lately, slugging it out with Borland for the desktop database market while also owning up to bugs in Access. Microsoft also must fight off continued doubts about NT's scheduled delivery date and packaging. Meanwhile, the upcoming release of several key PC applications under OS/2 2.0 adds to the pressure. *Pages 1, 8, 14*

Ten-year-old Novell finds it must confront new obstacles, including increased competition and support issues. *Page 12*

VIEWPOINT

Industry watcher John Gantz predicts a boom in 32-bit operating systems and a resulting shake-up in IS. *Page 29*

THE CW GUIDE: PRESENTATION SOFTWARE

Presentation tools are serious business for sales and marketing departments, which are often left on their own to choose and support tools. *Page 63*



Technical Sections

APPLICATION DEVELOPMENT	51
DESKTOP COMPUTING	33
ENTERPRISE NETWORKING	43
LARGE SYSTEMS	47
WORKGROUP COMPUTING	39

Departments

ADVANCED TECHNOLOGY	27
CALENDAR	62
COMPANY INDEX	91
COMPUTER CAREERS	77
COMPUTER INDUSTRY	93
EDITORIAL/VIEWPOINT	28, 29
FRIDAY STOCK TICKER	92
IN DEPTH	73
MANAGEMENT	57
MARKETPLACE	85

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News

Tandem drives client/server

By Jean S. Bozman
CUPERTINO, CALIF.

■ A year after outlining its client/server strategy, Tandem Computers, Inc. this week will launch a series of software products that support cooperative processing between Tandem's fault-tolerant computers and a wide array of desktop machines.

The client/server initiative, expected to be announced at this week's Client/Server Expo in San Jose, Calif., is based on a software tool kit with application programming interfaces (API) to link clients and servers.

Tandem is also bundling the tool kit with CLX/R servers ranging in price from \$69,900 to \$233,000. Some of the tools are now available; the rest will be available in the second quarter.

Tandem's client/server tool kit ties Tandem's proprietary Guardian systems to a wide range of clients, including Unix, IBM's OS/2, Microsoft Corp.'s MS-DOS and Windows and Apple Computer, Inc. Macintosh clients.

Other tool kit options will allow users to build Windows applications using Microsoft's Visual Basic or tools from Gupta Corp. and Powersoft Corp., according to Gary Sabo, Tandem's director of product marketing.

Some of the 100 beta-test sites have long wanted to retrofit their character-based applications with

graphical user interfaces on PCs and Unix workstations. Previously, users often employed dumb terminals to view Tandem database applications.

"We're going to bring some of the system functions, like screen processing, out to the workstation," said Doyle Kitchen, president of Information Processing Corp., a firm in Dallas that writes Tandem banking applications.

"Now we can bring the data out of the NonStop SQL database and conduct the analysis and graphics work in our Windows applications."

Some longtime Tandem users could not wait for the new client/server packages. "We jumped the gun on Tandem and wrote a client/server application before the beta program," said Doreen Wakefield, manager of data administration at Viking Freight System, Inc., a San Jose, Calif., trucking firm.

The tools will extend Tandem's proprietary Guardian operating environment, industry analysts said. "Tandem is recognizing that OLTP [on-line transaction processing] in the '90s is often front-ended by a GUI PC," said Roy Schulte, a software analyst at Gartner Group, Inc.

Tandem's fault-tolerant computers have always had a requester/server architecture, Sabo said. But without the new kit, users had few ways to link Tandem's proprietary NonStop SQL relational database with applications running on other vendors' hardware.

Building blocks

Tandem's client/server OLTP tool kit for client/server applications includes the following:

- Remote Service Call, a server-based API that links client and host applications.
- Pathway Open Environment Toolkit, a Tandem application development tool kit for developing client/server software.
- Tandem Dynamic Data Exchange (DDE) Gateway, which allows users to build Windows applications using Microsoft's DDE.
- Tandem Dynamic Link Libraries (DLL) Gateway, which uses Microsoft's DLL to link Windows applications with host database services.

Miller resigns from Wang

By Melinda-Carol Ballou
LOWELL, MASS.

Wang users and third parties were surprised by the sudden resignation last week of Richard Miller, Wang Laboratories, Inc.'s president and chief executive officer.

Miller, who drastically reduced the company's staff and sought to refocus Wang during the past four years, had previously said he would see the company through its Chapter 11 proceedings.

But last week, Miller defended his decision to leave, saying the company's reorganized business plan will be in place within several weeks. Such a plan must be filed by March 16.

Miller added that he believes the company is ready to "emerge from Chapter 11."

"Because Wang is preparing to emerge as a much smaller company, it needs to bring in a less costly management structure," Miller said. "I decided to step aside to allow the new management team to step in place."

Trio to take over

Replacing Miller will be a team of three managers that he brought in over the past several years: Michael Mee as chairman and chief financial officer; Donald Casey as president and

chief development officer; and Joseph Tucci as president and CEO.

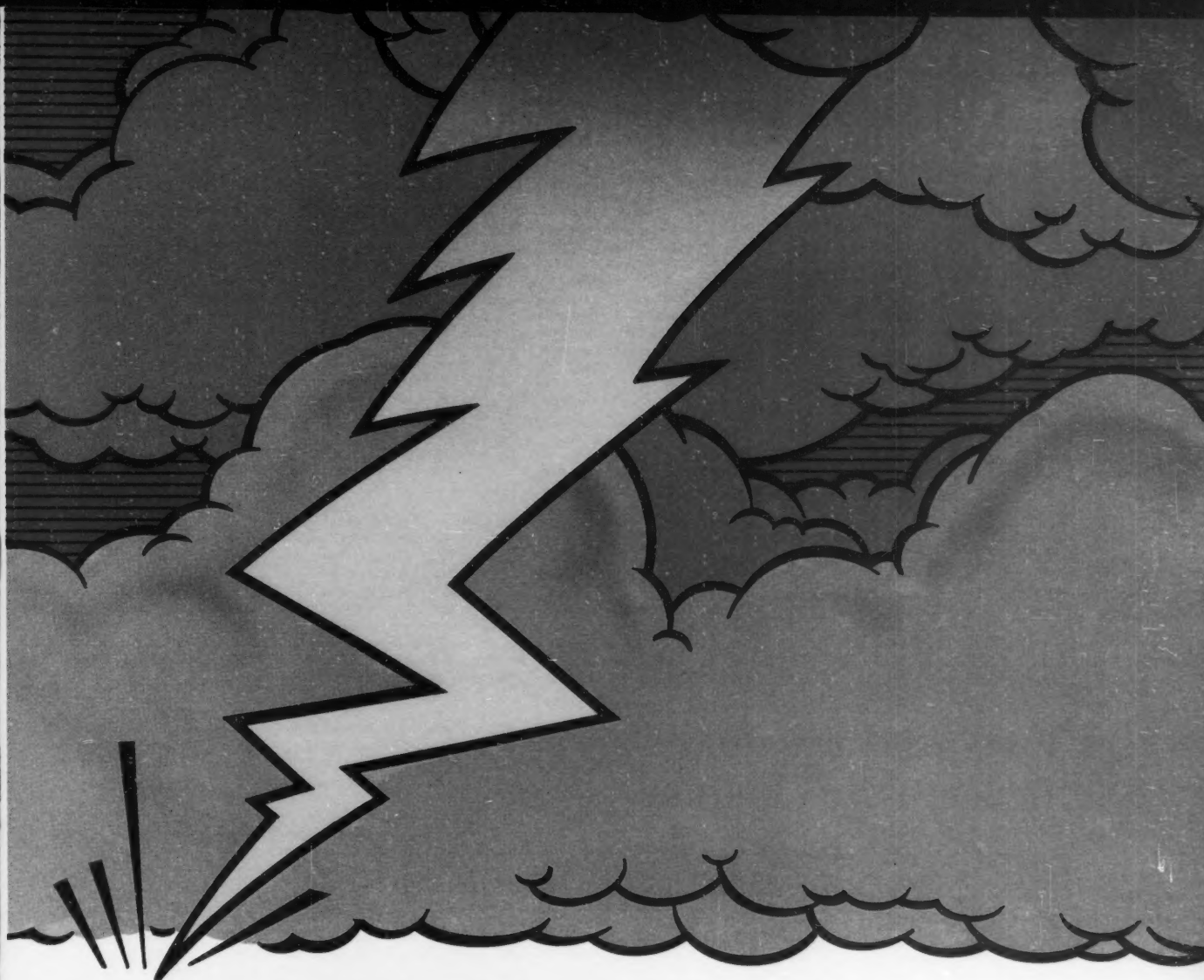
"It would be foolish to say it wasn't a surprise, but it's consistent with Wang's attempt to downsize," said Bill Sturgeon, president of the U.S. Society of Wang Users. He minimized the impact of the decision on the installed base.

The company reiterated its focus on end-user software, services and systems integration and its intent to continue moving away from manufacturing and the increasingly moribund minicomputer hardware market.

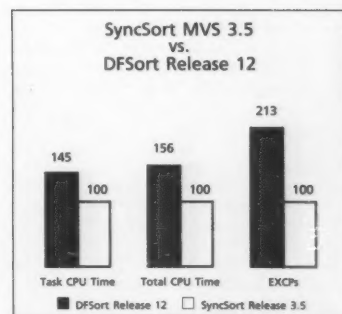
Tucci hastened to reassure customers that the company will support existing products and continue to make VS systems as long as "anyone wants to buy them."

But that reassurance is irrelevant for many users who are in the process of making the transition away from Wang products, according to Bill Sines, an analyst at Technology Investment Strategies Corp., a market research firm in Framingham, Mass.

He said Wang's proprietary offerings were not holding a user base that is increasingly drawn to open systems, and that software shipments planned for release in the next month or so on a range of Unix platforms may come too late.



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CA extends Unix software

Port plans

CA is reportedly working with NCR and Unisys Corp. to port Unicenter to their open systems platforms. Joseph G. Brown, vice president of marketing at Unisys' Unix Systems Group, confirmed that CA and Unisys have plans for a Unicenter-to-Unix port for Unisys' U 6000 Unix servers. However, Brown would not discuss delivery dates. CA's Sanjay Kumar declined to confirm such plans. CA could also eventually port its systems management package to Digital Equipment Corp.'s Alpha OS/1 operating environment, analysts said.

By Thomas Hoffman
ISLANDIA, N.Y.

In a week filled with moribund financial news, Computer Associates International, Inc. stood out with record quarterly revenue and earnings while detailing plans to expand nonmainframe software and support across its product lines.

At the center of CA's announcements was its decision to port its CA-Unicenter systems management product suite to IBM's RISC System/6000 AIX operating environment.

"If they're going to put better management tools on the RS/6000, that's good news for us. We're all looking for bigger and better tools to manage integrated networks," said Richard W. Lester, vice president of information services at Associated Grocers, Inc. in Seattle, which has 10 RS/6000s.

But Associated Grocers also runs Hewlett-Packard Co. and NCR Corp. Unix machines on its

network, so Lester said he would like to see a systems management tool designed for heterogeneous Unix network control. "It's important that the Unix systems management tool not be tied to any single vendor," he noted.

That is no problem, according to CA. Alan Paller, director of open systems at CA, said Unicenter for Unix can manage multiple Unix environments from a single console as if it were one common network.

Unicenter plans

CA, which earlier announced a Unicenter port to IBM's OS/2 2.0 operating system, plans to begin shipping Unicenter for the RS/6000 within the next 12 months, said Sanjay Kumar, CA's senior vice president of planning. The company is also porting Unicenter-to-Unix platforms from HP and Sun Microsystems, Inc.

Unicenter for the RS/6000 comes as CA follows through on earlier promises to improve customer ser-

FINANCIAL UPDATE

Computer Associates

Computer Associates' third-quarter income of \$80 million was a quarterly record

3rd quarter	
Revenue	\$501.5M
Percent change over same quarter 1991	19.7%
Income	\$80.2M
Percent change over same quarter 1991	48%

Source: Company reports

vice and support across its product lines [CW, April 20, 1992]. Last spring, CA created teams of client service representatives empowered to discuss with CA customers issues ranging from support to technical problems.

Since then, CA has doubled the size of its client services staff from roughly 80 agents to more than

170, according to Kumar.

Some CA customers said they have noticed an improvement in support. "We've definitely noticed a difference," said Laurie Belisle, a database administrator at Empire Financial Group in Kingston, Ontario. Since the client service program began, Belisle said, CA has been more accessible and has even helped Empire Financial reduce its annual software maintenance costs.

However, she added one caveat. "We find that they have a very high turnover rate in the reps that we deal with. Every few months we have to rebuild that working relationship. It may be the way they run the company, but it's kind of difficult for us," she said.

Still, CA's responsiveness to its customers appears to have positively impacted its bottom line (see chart).

"Without a doubt, one thing that is infinitely apparent when you talk to CA customers is how attentive CA is to them. It's helped customer relationships, and it's helping benefit CA," said Terrence Quinn, managing director at Furman Selz, Inc., a New York brokerage house.

IBM waves goodbye to worst year in company's history

By Johanna Ambrosio and Maryfran Johnson
ARMONK, N.Y.

IBM last week revealed a \$4.97 billion loss for 1992, the largest in U.S. corporate history, and said there is little hope of things getting better anytime soon. Even markets that have traditionally been bright spots for IBM, such as minicomputers and workstations, will see slower growth during 1993, analysts said.

"A modest recovery in the U.S. is being offset by very soft economic factors in Europe," said John Jones, an analyst at Salomon Brothers, Inc. in San Francisco. "We're expecting 1993 to be a very tough year."

An IBM spokesman concurred. "The near-term outlook remains unfavorable," he said.

The 1992 loss (see chart) includes charges for capacity and employee reduction programs and for accounting changes. Without deducting the charges, IBM's worldwide 1992 earnings were \$1.42 billion.

Financial summary

IBM's financial results included the following:

- Mainframe revenue fell 12% for the year, with total hardware sales plummeting by 20%.
- Revenue from PCs was down by about 15% compared with 1991, even though it bounced back some during the fourth quarter, the IBM spokesman said.
- Software revenue rose 5.8% for the year.
- Nonhardware sales, which include consulting, software and leasing hardware, accounted for 48% of IBM's 1992 revenue. This compares with 43% in 1991. Services performed particu-

FINANCIAL UPDATE

IBM

IBM's financials took a beating, ending the year with close to \$5 billion in losses

	4th quarter	Year end
Revenue	\$19.6B	\$64.5B
Percent change over same quarter 1991	(10.9)%	(.38)%
Income	\$(5.5B)	\$(4.9B)
Percent change over same quarter 1991	*	(73.5)%

* Not meaningful

Source: Company reports

larly well, with revenue up 32% for the year.

Particularly troublesome was the fact that even sales of IBM's traditional highfliers, the Application System/400 minicomputer and the RISC System/6000 workstation lines, slowed during 1992.

Although new products expected next month may help generate new revenue, any new sales probably will not make up for lost revenue elsewhere in IBM's lineup, analysts said.

Revenue from the AS/400 family fell by about 2%, compared with 1991, the IBM spokesman said.

Some users are still signing up for new machines. Jeffrey Mahoney, data processing manager at SCM Office Supplies, Inc. in Marion, Ind., said he has already ordered one of the new

AS/400s, a Model F35 that will be introduced next month. "We're interested in getting the most horsepower we can," he said. The new F family is expected to better the E models' price/performance by 30%, analysts said.

A similar story is told of the high-flying RS/6000 family, which had been growing by more than 40% per year but slowed to about 30% during 1992 and will pretty much stay there during 1993, according to analysts.

IBM is thought to be doing quite well with its high-end RS/6000 sales, but low-end desktop devices are priced too high, cramping large volume sales. Also, analysts said, RS/6000s sell most strongly in accounts that already have some IBM gear.

"Hewlett-Packard is beating them up in the commercial marketplace," said Bob Tipton, president of RS Tipton, Inc., a technical consulting firm in Denver. "And they've forsaken their bread-and-butter customers in the scientific/technical market" by failing to keep up with the superior graphics capabilities of some other vendors' workstations, he said.

Joe Garner, MIS director at CRSS Architects in Houston, said he recently signed on for three RS/6000s because of improved price/performance. And preliminary figures from Dataquest, Inc. show IBM holding fast to its No. 3 position in worldwide workstation revenue. From 1991 to 1992, IBM's market share grew to 18.4%, from 15.8%.

Although analysts said they expect IBM to stir up the competition once again on Feb. 2 — with the announcement of faster, cheaper RS/6000s from low to high ends — industry watchers are also mindful of the slumping economies both here and abroad.

"IBM tends to sell a lot of workstations into the aerospace and automotive industries and in Europe, and they've been impacted by economic issues," said Robert Herwick, an analyst at Hambrecht & Quist, Inc. in San Francisco.

Room to grow

A report by Needham & Co. in New York said

that after new-unit sales increased by 40% in 1989 and 30% in 1990, growth leveled off to about 11% in 1991 and 10% in 1992.

Meanwhile, the market for AS/400s at large companies is saturated but still has some room for growth, according to a recent survey by Computer Intelligence in La Jolla, Calif. The research firm estimated that some 49% of mainframe sites in the U.S. have one or more

minicomputers, up from 43% in 1989. The most popular minicomputer installed at these sites is an AS/400, the survey said. But some analysts disagreed about the AS/400's potential. "It's clear IBM is not getting follow-on business" for complex applications, said Tom Willmot, an analyst at the Aberdeen Group in Boston.

DISTRIBUTED QUERY COMPARISON

SYBASE

90 LINES OF COMPLEX CODE

```
/* reset the counter for build of third table */
se CREATE PROCEDURE la_qty
wi /* for use on WESTCOAST server */
be
/* returns count for one part only */
@partno char(6),
@la_count int output
AS
SELECT @la_count =
(SELECT qty FROM la_parts
WHERE partno = @partno)
/*
DECLARE @cnt int
DECLARE @counter int
DECLARE @la_count int
/*
DECLARE @partno char(6)
SELECT @cnt = COUNT(partno) FROM ny_parts
en
/* ny_parts is the parts master; need count
/* for sequential comparison with la_parts
/* to simulate a distributed join */
/*
/*
/* SELECT @counter = 0
/*
/* create temporary table for part numbers
/* and quantities from ny_parts */
/*
/* CREATE TABLE #allparts1
/* (partno char(6) NULL,
/* ny_qty int null)
/*
/* create temporary table for row numbers
/* for sequential call of la stored procedure */
/*
/* CREATE TABLE #allparts2
/* (seq int)
/*
/* create temporary table for
/* sequential build from first two temp tables */
/*
/* CREATE TABLE #allparts3
/* (partno char(6) NULL,
/* ny_qty int null,
/* la_qty int null,
/* seq int)
/*
/* build sequence numbers for each ny row */
/*
/* while @counter < @cnt
/* begin
/* select @counter = @counter + 1
/* insert into # all parts 2 (seq) values ( @ counter )
/* end
/*
/* populate temp table with ny parts and quantities */
/*
/* insert into #allparts1 (partno, ny_qty)
/* select ny_parts.partno, ny_parts.qty from ny_parts
```

*Program code independently written and tested.

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```
SELECT NY_QTY, LA_QTY
FROM NY_PARTS, LA_PARTS
WHERE NY_PARTNO = LA_PARTNO;
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News Shorts

SCO picks Michels' successor

The Santa Cruz Operation (SCO) last week selected the company's top European manager, Lars Turndal, to lead SCO. The appointment fills the gap left by company co-founder Larry Michels, who retired abruptly last month after a sexual harassment lawsuit was filed against him. The SCO board of directors also promoted Doug Michels by adding "chief technical officer" to his title of executive vice president.

IBM forms multimedia team

Unwilling to cede the budding desktop multimedia applications market to **Apple Computer, Inc.**, IBM last week formed a separate unit within its IBM PC Co. charged with fostering the development of multimedia applications. President of the new Fireworks Partner unit at IBM is Robert L. Carberry. He will report to James Cannavino, IBM senior vice president and general manager of Personal Systems.

Intergraph adds workstations

Intergraph Corp. in Huntsville, Ala., last week rolled out a new family of computer-aided design, manufacturing and engineering workstations and servers based on its C400 reduced instruction set computing (RISC) processor. The Series 2700, 6700 and 6800 workstations and servers, priced from \$12,500 to \$70,000, run Unix now with an option for **Microsoft Corp.**'s Windows NT later.

HP offers trade-in

With an eye to those 100,000 users still chugging away on former **Apollo Computer** Domain-based machines, **Hewlett-Packard Co.** last week announced its most extensive trade-up program yet to lure those potential customers into the fold. HP's Trade-Up '93 program, which will run throughout the year, accepts a broad range of workstations, PCs and X Window System terminals toward the purchase of new Precision Architecture-RISC workstations from HP. And not to be outdone, **Sun Microsystems, Inc.** is expected this week to counter with its own expanded trade-up program for Apollo users.

Chipcom blueprint

Local-area network vendor **Chipcom Corp.** last week mapped out its plan for migrating customers toward higher bandwidth communications. The firm plans to enhance its smart hubs to allow users to dedicate a full 10M bit/sec. Ethernet LAN to one workstation this quarter. Later in 1993, it will bring LANs onto a high-speed Asynchronous Transfer Mode (ATM) backbone, then bring ATM to the desktop in 1994 by integrating an ATM switching module into its hub, said David Fowler, Chipcom vice president of marketing.

Net management action

The **SNA MIB Consortium** had its first meeting last week to discuss how to develop management information bases (MIB) that would enable a variety of IBM Systems Network Architecture products to be managed via the Simple Network Management Protocol. The group plans to propose at next month's Internet Engineering Task Force meeting that a working group be formed to develop such MIBs.

SHORT TAKES Todd Rulon-Miller, former sales vice president at **Next, Inc.** has resurfaced as president of banking software vendor **Software Alliance Corp.** in Berkeley, Calif. ... **Syquest Technology** officials have advanced a new software driver standard they said will help ensure 100% interchangeability among drive subsystems.

News shorts, page 16

Stepping into a new system

By Johanna Ambrosio
HYDE PARK, MASS.

■ J. Baker, Inc., one of the country's largest shoe manufacturers, has injected a dose of high-tech soul into its soles. This month, the company will complete a multimillion-dollar mainframe conversion, which it accomplished while acquiring two companies, with another purchase on the way.

The move from a Honeywell Bull, Inc. DPS 8000 mainframe — and 15-year-old software — to an IBM mainframe started in September 1989, when Baker decided to re-engineer its entire business.

"We were not able to find information or to manipulate it, and we didn't have data down to the level of detail we needed," said Jay Scheiner, chief information officer.

The company decided to stay mainframe-oriented because at the time, it felt large systems were the only computers robust enough to handle its needs. Baker owns 140 shoe stores and leases space in 1,100 discount outlets, including **Jamesway Corp.** and **Caldor Corp.** For the year ended Feb. 1, 1992, sales were \$494 million; compound annual growth during the past five years has been more than 20%.

True payback on the system is slated for 1995, but the company will probably see big benefits beginning this year, Scheiner said.

"We started building the database in October 1991, but now everyone is just really starting to use it. We'll have data down to the level of what sizes are selling where."

Already, though, there have been a few advantages. The warehouse inventory levels in November 1992 were the lowest ever, Scheiner said. "It's a whole lot easier to run a business when everyone is working from one set of numbers."

Work on the technology component began in January 1990, when the company hired Andersen Consulting to determine whether to upgrade the Honeywell or move to a new system. An IBM 3090-150J was brought in but was upgraded to a Model 300S. "There were lots of Band-Aids holding [the software] together," Scheiner said.

Package picked

Baker opted for software from **Computer Business Applications**, which Andersen helped customize. Called **Genesis**, the package includes integrated modules for database management, merchandise analysis, purchase order management, sales and financials, among other tasks.

At the time of the conversion, Baker had 20 people in its information systems department; that figure has grown to 75. To help make the cutover, the company hired contract programmers to main-

tain the Honeywell system while Baker's own staff worked on and learned the new system.

In January 1991, Baker moved the corporate payroll data over to the IBM system. The Parade of Shoes division came up in June, the licensed-shoes division in September. In October 1991, Baker pulled the plug on its old mainframe.

Meanwhile, Baker was expanding into the apparel business by acquiring **Casual Male Big & Tall** stores and then the **Wearguard** store chain. The **Wearguard** group was brought up on the IBM system in February 1992, and the **Casual Male** division's cutover will be completed next month.

The firm chose an unusual way of rolling in the new system. After three months of making software changes and testing the IBM, Baker pulled the plug on the Honeywell and brought up the IBM during a weekend. That way, he said, "we wouldn't have to do a lot of throw-away work writing interfaces between the two systems or have inconsistent data between the two."

The real test may come later this year, as Baker gets ready to acquire **Morse Shoes**, which will almost double the size of the company. Scheiner is working with the IS executives at Morse to try to integrate the two. But he said he is not worried. "Our MIS staff is trained to do this. We have it down pat."



Forbes names first formal IS director

By Nell Margolis
NEW YORK

Thomas J. Casey, former information systems manager at the Boston general office of **New York Life Insurance Co.**, last week surfaced as **Forbes'** first formal IS director. His first assignment will be to get the magazine's five departmental PC local-area networks on speaking terms.

Powered to the front ranks of business journalism by the late entrepreneurial legend **Malcolm Forbes**, the company is now moving to give its IS setup some of the gloss that characterizes its expanding stable of publications.

Eleven months ago, the privately held company unplugged its IBM 4341 mainframe and outsourced its formerly mainframe-driven order fulfillment operations to **CDS,**

Inc. in Des Moines, Iowa. That left the LANs — **Novell, Inc. NetWare v3.11** setups — "currently running everything from Arcnet to Ethernet," according to Casey.

Fills a need

It was the need to build an infrastructure to support, interconnect and eventually expand these LANs that spurred **Forbes** to carve out its first officially designated IS director's slot, Casey said.

"As the technology has evolved, so has the title and the responsibilities that go with it," noted **Forbes'** Scott R. Yablon, vice president of administration. "Tom's job isn't necessarily bigger than the job that his predecessors held, but it certainly is different."

Forbes' IS staff formerly worked under the supervision of electronic data processing director **Joseph**

DeMarte, who now works for the firm's circulation department.

Forging tight LAN connections, Casey said, will help pave the way toward a series of IS initiatives aimed at slicker, quicker and substantively enriched production of the four magazines that make up the **Forbes** family: the flagship business biweekly; its two supplements, **FYI** and **ASAP**; and **American Heritage**.

Top agenda items for the new IS chief include replacing fax with on-line transmission of the barrage of research data constantly flowing among the home office editorial staff and their peers in **Forbes'** dozen or so bureaus, and giving writers and editors access to a slew of outside databases. "We're even talking about getting on the Internet to tie the editorial staff more tightly into what's coming out of academics," Casey said.

Right off the bat, Casey will be helping implement the editorial department's move from an **AteX, Inc.** publishing system to a PC-based system, final selection of which is imminent, Yablon said.

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```

/* Make sure deleted manager does not have any
/*Prohibit updates to the deptno foreign key in the emp table
(select count(empno) from inserted

CREATE TABLE dept
(deptno int not null,
dname char(14) not null)

CREATE UNIQUE INDEX dept_primary_key ON dept(deptno)

CREATE TABLE emp
(empno int not null,
mgr int null,
deptno int null)

CREATE UNIQUE INDEX emp_primary_key ON emp(empno)

CREATE TABLE proj
(projno int not null,
budget float null,
deptno int null)

CREATE UNIQUE INDEX proj_primary_key ON proj(projno)

/* Make sure deptno column of inserted emp rows is either null
or specifies an existing department. Also make sure that
mgr column of inserted emp rows is either null or specifies
an existing manager. */

create trigger emp_insert
on emp
for insert as
declare @row int
select @row = @@rowcount /* rowcount will get changed */
/* check "emp.deptno <=> dept.deptno" foreign/primary
key relationship */
begin transaction
if
(select count(empno) from inserted where
inserted.deptno is null)
+
(select count(deptno) from inserted
where inserted.deptno in
(select deptno from dept)
< @row
begin
raiserror 22220 "emp row specifies non-existent department"
rollback transaction
end
/* check "emp.mgr <=> emp.empno" foreign/primary key relationship */
else
if

```

*Program code independently written and tested.

```

CREATE TABLE DEPT
(DEPTNO NUMBER(2) PRIMARY KEY,
DNAME CHAR(14) NOT NULL);

CREATE TABLE EMP
(EMPNO NUMBER(4) PRIMARY KEY,
MGR NUMBER(4) CONSTRAINT mgr_fkey REFERENCES EMP,
DEPTNO NUMBER(2) CONSTRAINT dept_fkey REFERENCES
DEPT);

CREATE TABLE PROJ
(PROJNO NUMBER(4) PRIMARY KEY,
BUDGET NUMBER(7,2),
DEPTNO NUMBER(2) CONSTRAINT pdept_fkey REFERENCES
DEPT
ON DELETE CASCADE);

```

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ORACLE®

Silicon flexes 3-D muscle

By Maryfran Johnson
MOUNTAINVIEW, CALIF.

Silicon Graphics, Inc. upped the ante in the technical computing market today with the introduction of a line of advanced graphics supercomputers said to be 10 times more powerful than any previous Silicon Graphics system. The \$1 billion visual computing vendor is making headway against Hewlett-Packard Co. and Sun Microsystems, Inc. in technical accounts, particularly where three-dimensional graphics capabilities are important, said Ted Krum, an analyst at D. H. Brown Associates, Inc. in Port Chester, N.Y.

Along with the Onyx line of graphics supercomputers, Silicon Graphics is rolling out a \$35,000 Indigo 2 Extreme workstation, which is scheduled to ship this quarter with a 100-MHz CPU based on Mips Technologies, Inc.'s R4000 chip. A daughter card upgrade to the 150-MHz R4400 chip will be available later this year for \$6,000.

The company said it also doubled graphics performance in the midrange of the Iris Indigo line with the Indigo XZ reduced in-

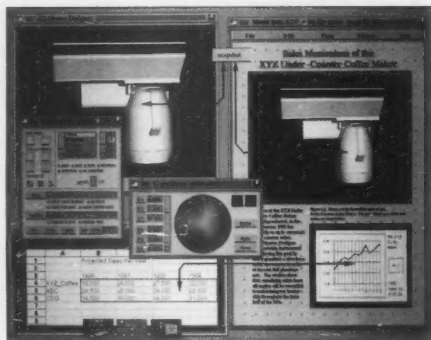
struction set computing PC, priced at \$23,000.

The Onyx systems, costing from \$114,000 to \$600,000, include Silicon Graphics' Reality Engine and VTX graphics subsystems. They can scale upward from two to 24 processors and are particularly

graphics for what I do," he said, echoing the comments of other users whose firms are ramping up their use of visual computing systems.

At Deere & Co. in Moline, Ill., for example, engineers are using Silicon Graphics' systems for analysis and prototyping work. "We like the SGI boxes because they're fast, elegant and easy to program for three-dimensional work," said John Howell, project manager at Deere. Increasingly, Silicon Graphics has been pulling its high-performance graphics downward into systems in the \$10,000 to \$40,000 range, a trend Howell called "refreshing."

"We think they're moving in the right direction," said Tom Linehan, director of visualization at CRSS Architects, Inc. in Houston, where roughly 20 Silicon Graphics systems are used for producing video and composite imagery, scene simulation and 3-D models. "We've also gotten a real competitive edge with the fast turnaround time between modifications of design. It used to take two to three months to redo a water color drawing, and now we can do it over lunch."



Silicon Graphics' Indigo workstation creates 3-D model

well-suited for image processing, video production, visual simulation and scientific computation.

"We're intrigued with the Onyx, and we'll be using one for sure," said Michael Zeitlin, team leader at Texaco, Inc.'s integrated visualization technology project in Houston. Texaco is deploying Silicon Graphics machines in a multi-million-dollar, worldwide acquisition of visualization technology.

"I can't get enough of faster

software could ship Windows NT by June, although he said the system may be slower than people had expected.

Others said it would be more likely that Microsoft will strip out some trouble spots, particularly in the area of networking, and release a lower functionality version of Windows NT that would be followed by a full package later in the year.

Craig Goldman, chief information officer at The Chase Manhattan Bank NA in New York, said he has reason to believe Microsoft will be "hard-pressed to have [Windows NT] out by June" and noted it made sense that the networking would be the first to go.

Networking first

Hill agreed, saying Microsoft would "pull the networking first and work their way down." A network-light version of NT could still be used on the desktop and would contain most of the benefits of a full 32-bit, preemptive multitasking operating system, minus some network management features.

Such a move would dovetail with information that indicates Microsoft may be considering shipping a "client" version of Windows NT that would include basic networking services such as full 32-bit processing and have preemptive multitasking.

However, it would lack symmetric multiprocessor support and some of the network and memory management tools of the full-blown Windows NT package.

Frank Dzubeck, president of Communications Network Architects, Inc. in Washington, D.C., said sources close to Microsoft told him that the company was investigating the possibility of releasing such a "client" version. But he could not confirm whether the decision had been made.

"That will not happen," claimed David Thatcher, group product manager for Windows NT. He noted that Microsoft has been pointing to Windows NT as both a client and server platform for the high end, so producing a "client" version of the operating system would be pointless.

Applications

1-2-3, WordPerfect coming for OS/2 2.0

By Michael Vizard

■ Users committed to OS/2 will begin to see their years of patience pay off as OS/2 2.0-compatible versions of two of the most popular PC applications are scheduled to roll out during the next four months.

Lotus Development Corp. in Cambridge, Mass., will deliver 32-bit OS/2 implementations of 1-2-3/G for OS/2 and its Freelance presentation graphics software in the first week of February, said Hilmi Ozguc, senior product manager for 1-2-3/G for OS/2.

Meanwhile, WordPerfect Corp. in Orem, Utah, last week said it will port its 16-bit implementation of WordPerfect for Windows to OS/2. Slated to ship in the spring, it will let users run Microsoft Corp.'s Windows package under OS/2.

The arrival of mainstream applications for OS/2 will put some substance behind IBM's claims of 1,200 32-bit applications available for OS/2. Most of these are user-built or service small niches.

Pricing for the Lotus packages will be about the same as for their Windows-based siblings. "We no longer believe that OS/2 application software can command a premium," Ozguc said.

Lotus intends to deliver Version 2.0 of its 16-bit 1-2-3 for Windows offering in the second quarter. "After that we'll be able to leverage the 32-bit work we did for OS/2 on the 32-bit version of 1-2-3 for Windows NT," Ozguc said.

WordPerfect's port of its 16-bit Windows implementation of WordPerfect is based on Version 5.2 of its word processor. The port uses technology developed by Micrografx, Inc. in Richardson, Texas, to allow a 16-bit Windows application to run over the 32-bit OS/2.

"It's a hybrid application. A native 32-bit version of WordPerfect for OS/2 will not arrive until WordPerfect 6.0 is delivered toward the end of the year," said Rich Running, director of marketing of WordPerfect for OS/2.

"The life of OS/2 will be maintained if the applications are there. Seeing the applications is encouraging because it provides a leap of faith in OS/2," said Tim Catton, manager of office system technology at Union Gas Ltd. in Ontario.

32-bit preference

While WordPerfect users running OS/2 would have preferred a native 32-bit implementation, they expressed some satisfaction with the firm's decision to make the hybrid port available.

"It's not a full 32-bit implementation, but it placates people," said Eric Lebow, network administrator for the 17th Judicial Circuit Court of Broward County in Fort Lauderdale, Fla.

Like most OS/2 sites, Union Gas had been running Version 5.1 of WordPerfect for Windows under OS/2. However, that version of WordPerfect is "ill-behaved," Catton said.

"Making 5.2 available on OS/2 is exciting to us because it resolves many of the issues we had with 5.1," he said.

"Over 80% of our users need Lotus' 1-2-3, Freelance and WordPerfect, so we need to deploy this software on the clients we are using for a client/server application we are building around CICS [transaction processing monitor] and OS/2," Catton said.

Lebow said his site's need for mainstream PC application software for OS/2 is being driven by a decision to standardize on OS/2 clients and servers in the interest of minimizing support costs.

"Windows doesn't have enough memory, and we need multitasking for some of our applications. Right now NT is vaporware, and the criticisms that Microsoft has leveled at OS/2 about large memory and disk space requirements have been exceeded in NT," he said.

NT doubts grow

CONTINUED FROM PAGE 1

ing it in the summer of 1991. What remains to be seen is whether Windows NT ships with all functions intact when it is released.

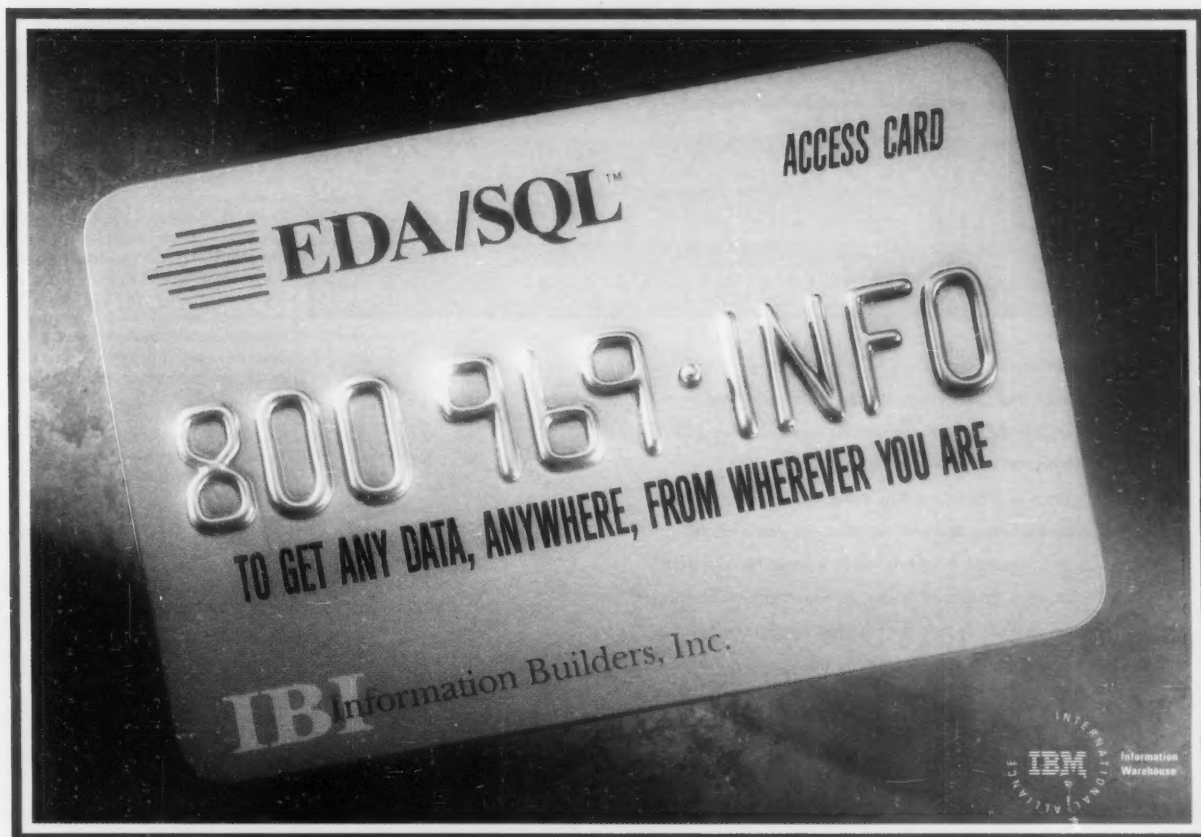
Dwayne Walker, director of Windows NT and networking products at Microsoft, said NT will be fully functional when delivered. He added he is confident it will ship on schedule. "The feature set we've laid out will absolutely be in the Windows NT first release," Walker said in a recent interview.

However, he added that Microsoft would not "paint ourselves in to a corner" and be forced to release the operating system before it is ready.

Indications are that it will not be, at least not by Windows World in May, when Microsoft is expected to throw its Windows NT launch party, according to Jesse Berst, publisher of the Redmond-based "Windows Watcher" newsletter.

Berst was optimistic that Micro-

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Defense Department IS chief steps down

By Gary H. Anthes
WASHINGTON, D.C.

The sudden resignation of Paul A. Strassmann as U.S. Department of Defense information systems czar left the Clinton administration in a lurch last week.

Strassmann was the Pentagon's accomplished but controversial director of defense information. Strassmann said officials in the Clinton transition team, with whom he had met several times, made it clear that he would not be retained by the new administration. Strassmann said he opted to resign

rather than stay until a replacement was hired.

Driven by a mandate from Congress to slash spending at the Defense Department, Strassmann struggled — with some success, most observers agreed — to modernize and bring order to the department's immense IS infrastructure.

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He launched the Corporate Information Management (CIM) program, which is intended to save the Pentagon \$36 billion over seven years (CW, June 8). Under CIM, Strassmann made progress toward streamlining and centralizing IS development and boosting software productivity.

He also introduced business process modeling and a departmentwide data dictionary.

But while acknowledging his successes and intellect, critics said he was at times dictatorial, he paid insufficient attention to details, and some of his reforms went too far.

"The strategic [CIM] program he put in was very, very important — the right thing to do," said Philip Kiviat, vice president of federal programs at Atlanta-based KnowledgeWare, Inc. and a long-time professional

associate of Strassmann. "But his tactics were poor. Most people didn't know what to do once they got past the high-level order."

The clash between Strassmann-led reformers and risk-averse entrenched interests reached a crescendo last fall over a Defense Management Review Decision, called DMRD 918. That order moved huge chunks of IS authority from the various military services and consolidated them into one central authority.

In an interview last week from his home in New Canaan, Conn., Strassmann acknowledged that implementation of the order had not gone well.

"What I do is controversial," he said. "Some of the concluding chapters, especially around DMRD 918, were not done by due process. They were dictated. Ultimately, DMRD 918 had to be rammed down. That's not my way."

Good timing

Thomas Giammo, assistant commissioner for IS at the U.S. Patent and Trademark Office, said Strassmann was smart to quit while he was ahead. "From a political point of view, the best way [to make significant change] is to just come in and smash it all and then move on. But ultimately, you have to be sacrificed. Hopefully, the good stuff you have done survives," Giammo said.

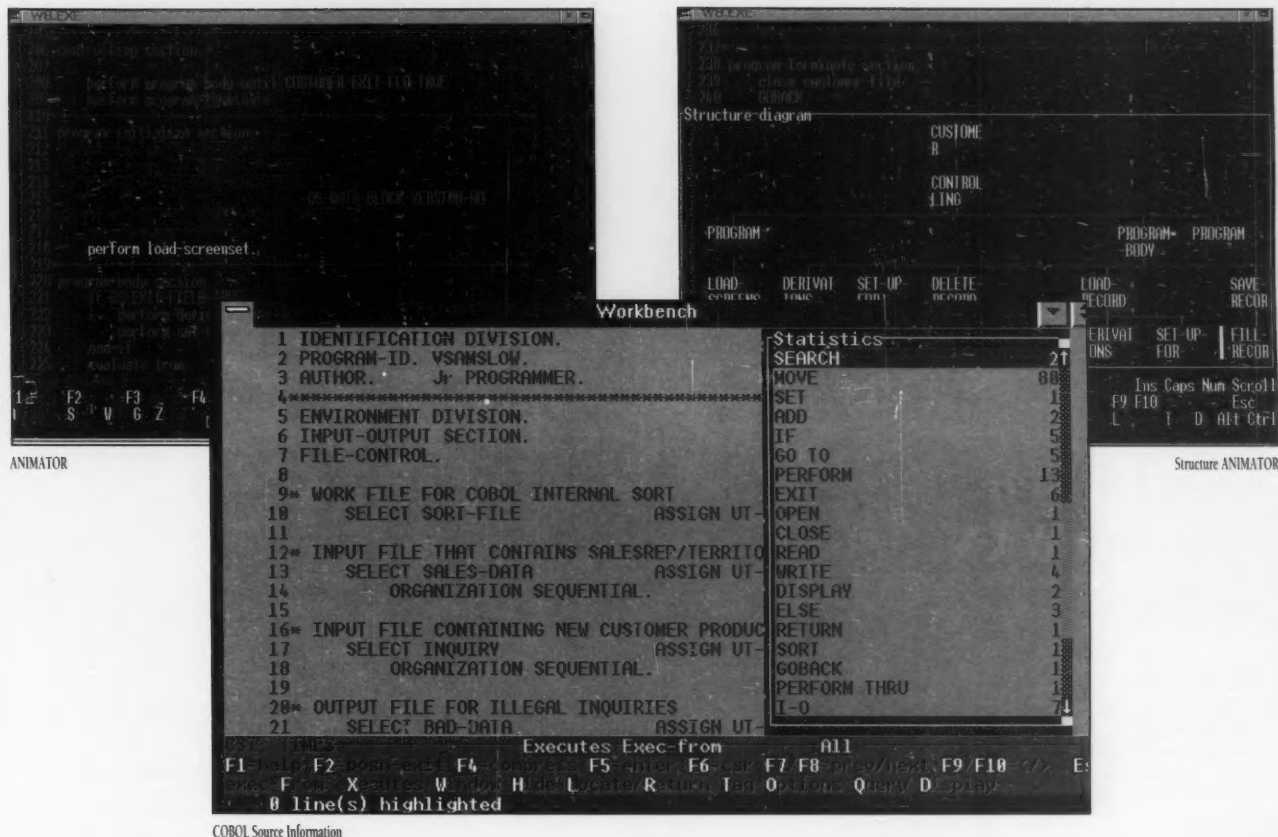
Several observers said it is difficult to judge the commitment of the Defense Department to further IS reform until assistant and deputy secretaries are appointed. But Kiviat said, "CIM must survive because [Congress] has taken all the money out of the budget. The only way they can afford to do things is by coming up with the savings CIM is supposed to produce."

Strassmann said the biggest challenge facing his successor — who is still unchosen — will be to develop an "enterprise model" for how information technology will support joint military missions.



Paul Strassmann launched the CIM program

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The next decade

Support, enterprise nets top Novell's future agenda

By Michele Dostert
PROVO, UTAH

In 1981, Drew Major had a bad feeling about working for a small company called Novell Data Systems. "I walked through the door and just knew they were going to go bankrupt," Major said. "They had horrible products, and they were burning up money. We made them pay us every week because we didn't think they'd last."

Today, Major is chief scientist at Novell, Inc., the standard-setting successor to Novell Data Systems that will mark its 10th anniversary this week with more than 3,600 employees and 1992 revenue of \$933 million. Novell's NetWare network operating system is holding fast to a commanding two-thirds share of the local-area network market despite competition from vendors in virtually every market segment.

As such, Novell is not resting on its laurels. The company knows it has to face and meet a brand-new set of challenges in the next decade. "Now we'll have to prove ourselves in more complex environments, where networking is

the order of the day, and we'll have to respond to increased competition," said Ray Noorda, Novell's president and chief executive officer since its incorporation in 1983 (see timeline).

Chief among those challenges is providing enterprisewide computing products and strategies for networks managed and built by information systems groups. This feeds into a second objective: winning over IS managers.

Novell's corporate buddies have a long shopping list of additional technology they expect Novell to provide in the near future. These include application programming interfaces and integrated technology for building client/server applications, wide-area links, multiprocessor support and beefed up capabilities on its multiprotocol router.

"We need our LANs in Switzerland to talk to our LANs here, and we're not sure if Novell can handle it or if we should build an SNA backbone," said Patrick Carney, IS director at



Ray Noorda: 'We'll have to prove ourselves'

ASEA, Brown, Boveri's office in North Brunswick, N.J.

In an interview this fall, Darryl Miller, Novell's executive vice president, said the firm spent a lot of time in 1992 with Fortune 1,000 IS vice presidents and chief information officers to learn their concerns. "We're making NetWare easier to manage and doing extensive work in multiprotocol routers and hubs" as a result, he said. "Through our agreement with Memorex Telex, we're hoping to hasten LAN-to-host and wide-area products to market." Miller said Novell is also working on multiprocessing and transaction monitoring for NetWare platforms.

The speed with which Novell can respond to IS requests such as these will determine its success in the Fortune 1,000 market, said Janet Hyland, director of network strategy research at Forrester Research, Inc. in Cambridge, Mass.

For example, users have long pressed Novell to deliver directory services similar to StreetTalk from Banyan Systems, Inc. The long-awaited NetWare 4.0, now being beta-tested, is supposed to address that issue. So far, early reports have been positive [CW, Jan. 18].

Also key to Novell's future success is its response to increased competition and the threat that network operating systems may get pulled back into the operating system.

Possibly its closest threat is Microsoft Corp. Microsoft's LAN Manager failed to dent Novell's lead, but the Bellevue, Wash., company has formulated a new plan of attack: incorporating the network operating system into the desktop operating system.

Microsoft's new Windows for Workgroups product has built-in peer-to-peer networking; the forthcoming Windows NT will have both the client and server software for LAN Manager built into it at no additional cost.

Two-pronged attack

Novell is attacking on two fronts: bundling peer-to-peer networking and DR DOS in a forthcoming package called "Personal NetWare" and preaching the gospel of modular systems.

"We think users shouldn't be forced into signing up with one vendor for everything at the cost of functionality," said John Edwards, vice president of Novell's Desktop Products Division.

But Microsoft's "buy the desktop, get the networking free" strategy appears to have Novell worried. Novell's acquisition of Digital Research, Inc. in 1991 and proposed acquisition of Unix System Laboratories, Inc. late last year is viewed by analysts as a reactive strategy.

The December release of Novell's UnixWare — a merged version of Unix System V Release 4.2, the NetWare operating system and Unix tools available in client and server versions — positions UnixWare as a direct competitor to Microsoft's forthcoming Windows NT.

The company also moved quickly to challenge Microsoft's use of its NetWare code, charging unauthorized use in both Windows for Workgroups and the Access database. The two firms are still arguing over this.

Craig Burton, president of The Burton Group, a Salt Lake City-based LAN research firm, and Novell's executive vice president of development until 1989, said: "Novell should focus all of its efforts on networking products and support, and not worry about Microsoft."

Coral, Cisco broaden WAN options

By Joanie M. Wexler

■ Two vendors took action last week to satisfy user hankerings for more reliable and higher performing internetworking gear — demands spurred by the increasing sophistication of corporate data highways.

Router market leader Cisco Systems, Inc. rolled out its long-awaited next-generation platform, the Cisco 7000 [CW, Jan. 18]. The 7000 is available now and allows Cisco equipment to better rival the appeal of some competitors' scalable, redundant devices.

Meanwhile, start-up Coral Network Corp. revved up its high-end Backbone Express bridge/router with a new model said to be fast enough to make performance a nonissue in users' bridge vs. router decisions.

While Cisco touted performance leaps derived by shifting some nondata forwarding tasks from the router's main 533M bit/sec. internal bus to two other, lower speed buses, "this architecture leaves a lot to be desired," said Frank Dzubeck, president of Communications Network Architects, Inc. in Washington, D.C.

Dzubeck said he was expecting a "busless" — switching — architecture and predicted a life span of "about three years" for the 7000.

Users, though, were excited to get backup

The Cisco 7000 will gain an ISDN primary-rate (1.5M bit/sec.) interface and an IBM Escon channel interface before the end of next year.

power protection and hot-swap capabilities, which greatly increase network uptime. "Reliability and survivability are more important to us" than performance, said David Paul Zimmerman, telecommunications analyst at New Brunswick, N.J.-based Rutgers University, a Cisco 7000 beta-test site. Zimmerman said he actually "got bored trying to break the box."

Zimmerman has replaced three of his four high-end Cisco AGS+ routers with one 7000, which supports about 25% more networks than the AGS+.

Another beta-test site, the Oak Ridge National Laboratory in Oak Ridge, Tenn., has found the 7000's ability for centralized software downloading "important in a 24-hour enterprise environment with lots of hosts and wide-area connections," said Curt Bemis, a senior staff member.

Coral's Backbone Express 2000 reportedly raises routing performance of Transmission Control Protocol/Internet Protocol to 120,000 packets per second via a home-designed silicon switch processor. That number is slated to increase to 400,000 packets per second in June and apply to several other key protocols during the second half of the year.

"Right now, we're not basing our bridging vs. routing decisions on speed," said Ken Roux, a telecommunications/network manager at Coral customer Claris Corp. in Santa Clara, Calif. "But that will truly be an issue for us in the future, so it's not to be passed off lightly."

"Performance no longer being an issue is good," added Tom Schnabel, a network engineer at Coral customer TRW, Inc. in Redondo Beach, Calif. "Bridging tends to be faster, but we don't get the firewalls" and security-oriented partitioning from other networks "that we do with routing," he said.

Milestones

October 1981: NetWare developers begin work at Novell Data Systems.

January 1983: Ray Noorda joins Novell Data Systems as president and CEO. Company incorporates as Novell, Inc.

January 1983: First Network File Server software released.

September 1987: NetWare for Intel 286-based boxes.

December 1988: First NetWare server for the Macintosh.

February 1989: NetWare for Unix.

September 1989: NetWare 3.0 for 386/486-based servers.

December 1989: NetWare SQL ships.

October 1990: Records \$497 million in revenue.

May 1990: Lotus merger aborted.

February 1991: Novell/IBM alliance.

March 1991: NetWare v3.11.

April 1991: USL investment.

September 1991: NetWare Lite.

October 1991: Buys Digital Research.

December 1991: Forms joint venture called Univel with USL.

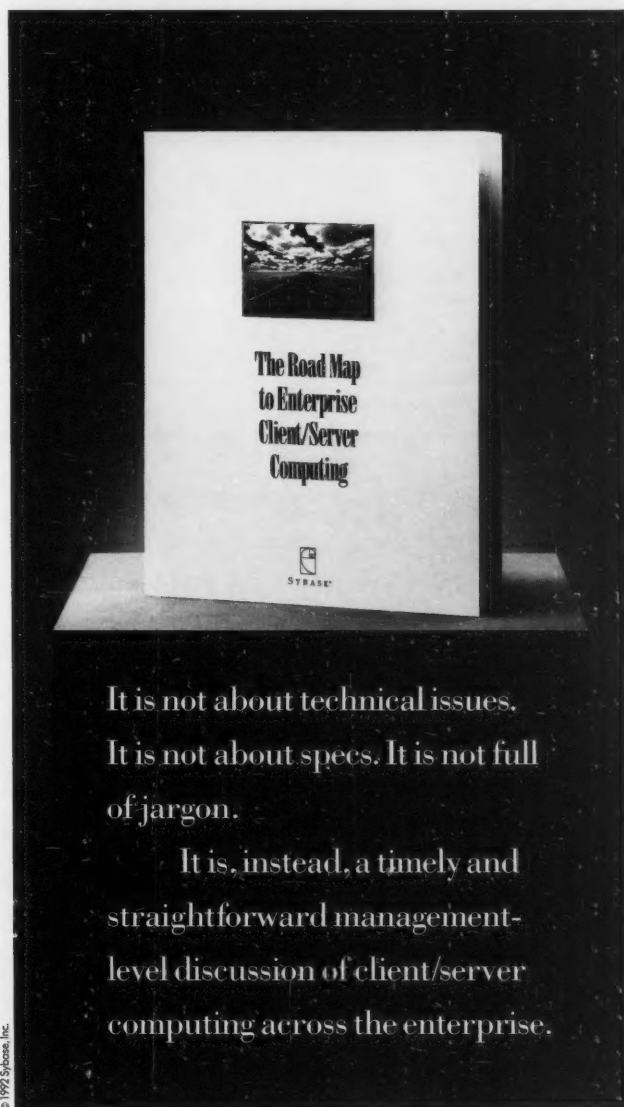
September 1992: NetWare 4.0 enters beta testing.

October 1992: Records \$933 million revenue.

November 1992: Ships UnixWare.

December 1992: Acquires USL.

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Borland blames marketing, revamp for loss

By Michael Vizard
SCOTT'S VALLEY, CALIF.

■ The effects of a failed marketing effort for its Quattro Pro spreadsheet, combined with an inability to deliver other Microsoft Corp. Windows applications in a timely manner, came home to roost last week at Borland International, Inc. as the company reported a \$63.1 million net loss for the third quarter ended Dec. 31.

During an address to members of the Massachusetts Computer Software Council, Inc. last week in Newton, Mass., Borland Chief Executive Officer Philippe Kahn said the company's loss reflects the restructuring it undertook in 1992, which Kahn has previously described as his worst year ever.

"We are building an organization that is in full-battle mode. We have to compete with a company in the Northwest [Microsoft Corp.] that is very powerful, builds good products, is very aggressive and omnipresent," Kahn said.

Some users are confident Borland will overcome its problems. "I

think Borland will be around for a long time to come," said Barton Evans, vice president of operations at Dionex Corp., a Sunnyvale, Calif., manufacturer of chemical analytical equipment. "A lot of companies face the same fundamental problems Borland does, so if Borland goes away then they'll all go away for the same reasons, and I don't think that will happen."

Reasons for slide

Taking its toll on Borland's latest results was a \$25 million charge related to a decision last month to cut 15% of its 2,200 employees. At the same time, Borland incurred a \$9.8 million charge related primarily to a failed marketing campaign for its Quattro Pro for Windows spreadsheet.

That program let users buy Windows and DOS versions of Quattro Pro in the same package. "It was essentially two different products in the same package, and the market was confused by it," said Chief Financial Officer Alex Hendricks.

Borland has initiated an equally aggressive 90-day, \$99 price for Quattro Pro [CW, Jan. 18], both to

make up for the failed Quattro Pro program and to respond to Microsoft's aggressive introduction of its Access database.

FINANCIAL UPDATE

Borland

Consolidation and work force reduction charges contributed to Borland's third-quarter loss

3rd quarter

Revenue \$104.3M

Percent change from same quarter 1991 (9%)

Income \$(61.3M)

Percent change from same quarter 1991 *

The quarter included a \$25 million pretax charge for work force reduction, facilities and write-off of software technology as well as a \$9.8 million charge for inventory write-downs, freight and rework.

* Not meaningful

Source: Company reports

Another key to Borland's recovery is delivery of Paradox for Windows, which Kahn said will ship on Feb. 1, for a 90-day introductory price of \$139.95.

"Succeeding at databases is key to our company's future," he said. "When [Microsoft Chairman Bill] Gates released Access for \$99, we knew we were in his cross hairs," Kahn said. Microsoft has sold more than 500,000 Access licenses.

Beyond 90 days, however, Borland has yet to decide what the price of Quattro Pro and Paradox will be, he added.

Because of its current financial troubles, Borland is expected to focus on servicing its installed base. "There's a lot of pent-up demand for Paradox, and the company stumbled badly with Quattro Pro," said Mary McCaffrey, a vice president at C. J. Lawrence, Morgan Grenfall, Inc., a New York-based securities firm.

Analysts are also concerned that Borland carried a \$23 million operating loss on revenue of \$104.3 million for the third quarter. The company attributed a \$10.7 million drop in quarterly revenue to its latest Quattro Pro promotion, which offered a rebate to sites that purchased the Win-DOS version of the spreadsheet.

Key to success

Borland needs a 35% share of the Windows spreadsheet market and more than 50% of the database and C++ language market for Windows in order to be truly successful, Kahn said.

R&D rise

Borland spent \$18.9 million of its research and development budget during the third quarter. That represents a 34.8% rise over the \$14 million spent in the same quarter a year ago. Those costs were largely incurred as the result of adopting an object-oriented programming approach for its Windows application development environment.

Microsoft gives Access interim bug fixes

By Jean S. Bozman

Microsoft Corp. has owned up to 23 bugs in its first release of the Access desktop database and query tool. None are showstoppers, said Charles Stevens, manager of Microsoft's database division. Software engineers have provided workarounds for the bugs that are posted on the Microsoft Access Forum on CompuServe, he added.

"Before June, we will ship Release 1.1 with new database drivers, and we will fix any of the bugs that have been reported," Stevens said.

Here are some of the top Access bugs and the workarounds:

- Microsoft Access SETUP program may leave temporary directory and files on disk.

Microsoft's explanation: "If you request SETUP to install SHARE and then choose the option to reboot your machine, SETUP will not properly clean up temporary files on your hard disk."

Fix: "Do not choose to reboot your machine at the end of the installation process; or simply delete the [temporary] files and di-

rectory after the reboot process."

- Stac Electronics, Inc.'s Stacker 3.0 data-compression program for hard disks incorrectly states Access database files are corrupted.

Microsoft's explanation: "The file is fine."

Fix: "The newest version of Stacker 3.0 fixes these messages and is available from Stac Electronics in Carlsbad, Calif."

- Access cannot use Novell, Inc.'s Btrieve data with indexes across column boundaries.

Microsoft's explanation: "Access does not support Btrieve indexes, which have keys defined on a column or across boundaries."

Fix: "You must remove the indexes or recreate them so that they align on column boundaries."

- Problem importing .DBF files where record length exceeds Borland dBase maximum.

Microsoft's explanation: "CodeBase++ Version 1.07 lets you create .DBF files where the record length exceeds the dBase IV max."

Fix: "Export the CodeBase++ .DBF file to delimited text, then import the ASCII file into Microsoft Access."



Networked DBMSs

CONTINUED FROM PAGE 1

picked for evaluation. Normally, PC database prices range from \$500 to \$700.

The database pricing wars should reach a new level on Feb. 1, when Borland is expected to ship Paradox for Windows, complete with a new object-oriented development environment called Object Paradox Application Language. On the same day, Microsoft's introductory price for Access will jump to \$495. But Microsoft believes its three-month promotion will produce about 700,000 Access evaluations.

Microsoft Chief Executive Officer Bill "Gates has made it very clear that he'll use any means at his disposal, including price, to get there," said Terrence Quinn, a managing director at New York investment firm Furman, Selz, Inc.

But winning account loyalty will take more than pricing as the drift toward open systems gets stronger. "All the pieces of our architecture are very modular," said Kim Everingham, a systems analyst at SRI International, Inc. in Menlo Park, Calif., which uses both Microsoft and Borland products. "We could switch out Microsoft Excel as a front end, and we could use any SQL-based back-end database."

Even so, Microsoft is advocating a building-block approach, said Charles Stevens, manager of Microsoft's database division.

Borland, which had nearly 80% of the PC database market, has seen its dBase market erode, while the Paradox base is growing, Quinn said. It is counting on a more integrated approach, linking all its database products through the Integrated Database Application Programming Interface and consolidating data

on its high-end InterBase server.

The Westpal Group, a custom software house in Camarillo, Calif., moved up from desktop Paradox to an InterBase server on a Unix machine four months ago. "Right now, we think InterBase is terrific," said President Paul Sharp, "but if Microsoft comes out with a better product tomorrow, then we'll wave the Microsoft flag. I have to do what makes business sense."

The timing for the database deal is right: Many large firms will start to weave stand-alone databases into networked enterprise resources later this year, as a wave of Microsoft Windows client/server development begins.

At the same time, several powerful database platforms will become available, including Windows NT servers, Novell, Inc. NetWare Loadable Modules of most major databases and new Unix PC LAN servers.

Many users are eager to shift I/O-intensive database loads to high-capacity platforms. "Those PC databases start huffing and puffing when you start running 100M-byte database tables and doing a lot of heavy querying," said Sharp, who develops and tests applications for several Fortune 500 companies in California. "The data load is just killing those LANs."

Many sites count on cost savings from downsizing applications onto cheaper hardware. SRI International plans to save the cost of a new minicomputer by consolidating old flat-file databases and deploying new applications on Sun Microsystems, Inc. workstation servers and Apple Computer, Inc. Macintosh clients.

The intensity of the Borland/Microsoft marketing war has not been lost on users. "I want a small tool suite that is robust," said Michael Fitzmaurice, director of information systems at the National Association of Broadcasters in Washington, D.C.

KnowledgeWare to buy client/server firm

Acquires Matesys Corp. to challenge Powersoft's turf in expanding market

By Garry Ray
ATLANTA

The bells for client/server computing tolled once again as mainframe computer-aided software engineering vendor KnowledgeWare, Inc. last week agreed to acquire a small developer known primarily for its client/server tools.

KnowledgeWare's bid to acquire Matesys Corp. in Larkspur, Calif., and its ObjectView development tool places the company in head-to-head competition with Burlington, Mass.-based Powersoft Corp., the dominant player in the client/server tools market.

Powersoft filed its initial public offering last week, seeking an estimated market value of more than \$250 million for its shares (see story page 93).

What a relief

KnowledgeWare's acquisition would relieve concerns about the company's less-than-robust offerings in the client/server arena.

Last year, the company acquired Viewpoint Systems, Inc. for its graphical user

development tools from KnowledgeWare and other vendors. He said the points of integration will be the ADW Encyclopedia, IBM's LAN Repository and an application programming interface to ObjectView itself. Integration with the ADW

Encyclopedia would be "nearly immediate."

David Dewan, vice president and co-founder of Powersoft, said there is plenty of room in the exploding client/server tools arena for more than one player.

"We're seeing the beginning of enormous change in platforms. The market is huge," he said.

The acquisition, which KnowledgeWare will fund with a 900,000-share stock issue, is valued at about \$12 million.

According to Matesys President and CEO Michel Prompt, the sale should be complete "by the end of February" because of the company's French ownership. However, he said, "We consider that the deal is done now."

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Income: \$858,000		
Number of licenses: 104,000		
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5/91	Quinsoft	Object-oriented client/server
8/91	Language Technology	Cobol restructuring maintenance
6/92	Viewpoint	GUI builder
10/92	Computer and Engineering Consultants Ltd.	Client/server tools

interface development tool, Flashpoint. Analysts said the tool was not a robust client/server offering.

"Flashpoint is a nice product, but it's for revamping mainframe applications," explained Andrew Mahon, a senior analyst at consultancy New Science Associates, Inc. in Westport, Conn. "ObjectView is on par with [Easel Corp.'s] Enfin/2 or PowerBuilder," which focus on building true client applications.

KnowledgeWare officials agreed that they will be vying for Powersoft's turf with Matesys and said they think they have found a competitive offering.

"From a competitive perspective, ObjectView stacks up rather well against PowerBuilder," said KnowledgeWare President and Chief Executive Officer Donald P. Addington.

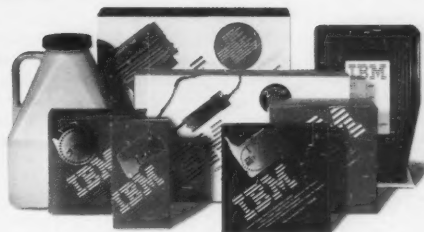
Addington outlined a three-phase plan to integrate ObjectView with application

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News Shorts

Compaq pares notebook prices

Compaq Computer Corp. cut prices on its Contura line of notebooks by 12% to 16%, bringing the price of a passive-matrix color notebook to less than \$2,000. Analysts said the move was largely to make room for new **Intel Corp.** i486-based versions of the Contura, expected later this quarter. Janet Cole, analyst at **Dataquest, Inc.**, added that Compaq's perception as a price leader in the market may make other notebook vendors follow suit with across-the-board price cuts on the low end of their product lines.

DEC adds industry specialists

Digital Equipment Corp. last week announced another appointment of a vice president from outside the organization: Paul Kozlowski will head up DEC's communication, education and entertainment business unit. Kozlowski founded **Contel Cellular, Inc.** in 1982 and led its merger with **GTE Mobile Cellular, Inc.** in 1991. Earlier this month, DEC brought in John Klein as vice president of the consumer and process manufacturing industries business unit and Francis Arnone as industry director at DEC's retail/wholesale business unit. Klein is a 25-year **IBM** veteran. Arnone was formerly chairman and chief executive officer of **Marshalls, Inc.**

DEC offers POS package

DEC announced its "No-Fail Retail" system at the National Retail Federation Conference in New York, introducing a system designed to minimize point-of-sale downtime. The Unix-based system includes DEC's High-Availability Data System, a disk-mirroring technology designed to provide redundancy.

Lotus, Borland head for trial

The legal war between **Lotus Development Corp.** and **Borland International, Inc.** is set to go to trial next week in U.S. District Court in Boston. The judge has allowed Lotus to amend its complaint to include Borland's use of a macro key reader in **Quattro Pro** for Windows. The macro key reader allows **Quattro** users to use the macros they created for **Lotus' 1-2-3** spreadsheet. The case hearing is scheduled for Feb. 1.

Coke licenses Delrina software

Delrina Corp. in Toronto last week said its wholly owned subsidiary **Delrina Technology, Inc.** has signed a worldwide license for its **PerForm Pro** Plus forms processing software with **The Coca-Cola Co.** in Atlanta. The deal marks Delrina's largest corporate license ever with a Fortune 100 company and is valued in excess of \$2.5 million. The latest release of **PerForm Pro** Plus includes extensive database management features and a macro-like language that allows users to link forms created with the package.

SHORT TAKES DEC has penetrated the Top 10 PC maker ranking for the first time, according to **Computer Intelligence**, which said DEC's PC sales ramped up past about 20 other vendors to reach its ranking of No. 9. . . . The **International Trade Commission** established an Office of International Competitiveness to analyze the factors that affect U.S. economic competitiveness. . . . Electronic-mail vendor **Beyond, Inc.** in Cambridge, Mass., raised \$6.6 million in a round of financing for the research and marketing of workgroup computing products, with **Novell, Inc.** and **Banyan Systems, Inc.** each kicking into the pot. . . . Vendors of Token Ring networking products, including **Proteon, Inc.**, will gather at the University of New Hampshire next month to begin testing their products' interoperability running at 16M bit/sec. over unshielded twisted-pair wiring.

X.400 directories synchronized

By Lynda Radosevich
SANTA CLARA, CALIF.

Retix this week will announce a new X.400 directory exchange server as part of its Open Messaging Solution strategy for companies faced with connecting dissimilar electronic-mail systems.

The \$9,995 Directory Exchange Server (DXS) aims to address one of users' loudest complaints about sending mail between different systems: getting the various directories "synchronized" so that one system recognizes E-mail addresses from other systems.

Combined with Retix's upgraded "gateways" — software that translates CC-Mail, Microsoft Corp. Mail and Message Handling Service protocols to the X.400 protocol — the DXS will maintain a central database of users across the network and send the information to participating mail systems. It will also provide a migration

path to the upcoming X.500 directory standard.

"Directory synchronization is a big problem," said Mark Gleason, network analyst at PMA Reinsurance Corp. in Philadelphia. The company exchanges E-mail with insurance brokers from more than a dozen firms.

PMA uses a gateway to connect DaVinci mail to a Retix X.400 server, while the other firms have gateways from their systems to X.400. Although the companies can exchange mail over the X.400 backbone, users commonly call the intended recipient and get their address over the phone before sending a message to another company, Gleason said.

The directory synchronization products from Retix could help solve the problem, he said, but he was concerned that automatic directory exchange would give other companies all of PMA's E-mail user addresses.

Other new products will be included in Retix's announcement: remote management software, updated E-mail "gateways" (software that converts E-mail formats) and an upgrade for Retix's line of X.400 messaging servers.

The Retix solution is confined to PC-based local-area networks. Although a gateway to the Simple Mail Transport Protocol used by Transmission Control Protocol/Internet Protocol networks is "coming down the road," Retix offers no gateways to mainframe-based E-mail systems such as IBM's Systems Network Architecture Distribution Services (SNADS).

Rival Soft-Switch, Inc. in Wayne, Pa., also provides an X.400 messaging backbone in its EMX line and offers gateways to 50 E-mail systems, including SNADS. The company will introduce directory synchronization capabilities for its EMX line in six months, according to a Soft-Switch spokesman.

Wal-Mart spotlights fast LANs

CONTINUED FROM PAGE 1

Mart's basic satellite infrastructure, Fitzgerald said.

Like most major retailers, Wal-Mart needs satellite links to reach its more remote sites, which are still inaccessible to high-speed carrier services such as frame relay, he added.

For some time now, Wal-Mart has been in the vanguard of an industry trend toward tracking products in greater and greater detail, for purposes of market analysis and faster inventory turnover, according to Carl Steidtmann, vice president and chief economist at investment research firm Management Horizons, a Price Waterhouse division in Columbus, Ohio.

"It used to be we just tracked, say, sweaters, by the number sold," Fitzgerald said. "Now we track by size and color — much finer detail. And with that comes additional data" to be sent back to the data center for analysis.

In addition, Wal-Mart is four or five years ahead of its competitors when it comes to implementing "a

continuous replenishment system," in which stores send orders for new merchandise directly to the suppliers as soon as the consumer takes it out the door, Steidtmann said.

At Wal-Mart, stores order replacement items directly from the supplier daily, Fitzgerald said. Point-of-sale (POS) terminals that record the transactions send the data to a Unix server via a Token Ring LAN; the server then sends the orders, via satellite link, to the home office IBM Enterprise System/9000s. There they are batched together with other store orders, he said.

Store purchasing can also be done through handheld bar-code terminals connected into the LAN via radio-frequency modem. The bar-code terminals are used to ensure accuracy of pricing and shelf level data.

The advantage of direct store-to-supplier ordering is the ability to keep the right products in stock while maintaining extremely low inventory costs, Steidtmann said.

Indeed, Wal-Mart's inventory-to-sales ratio in 1991 was 1 to 5.94, compared with Kmart Corp.'s ratio of 1 to 4.58, he added.

Several other strategic applications of the new network are now in the works at Wal-Mart. One that came out about a month ago involves downloading to store department managers images that depict how a given item can best be displayed, he said.

The retail chain is also experimenting with replacing "thousands of trees worth" of training manuals with on-line training support delivered via multimedia PCs installed at stores, Fitzgerald said.

The LAN-to-VSAT link also promises to boost customer satisfaction and get customers out the door faster by speeding up POS transactions such as credit-card verification, Fitzgerald said.

Wal-Mart's IS department is particularly thrilled at the ability to manage 20,000 or so LANs as one system, Fitzgerald said. An increasingly distributed, client/server environment has increased Wal-Mart's reliance over the past few years on effective network management to keep all systems and links up and running, he added.

The department has been working since September 1990 on a Simple Network Management Protocol-based network management system. Besides doing the usual traffic monitoring and troubleshooting of LAN and satellite links, it will monitor the Unix servers, PCs, power supplies and, eventually, even environmental systems in buildings, Fitzgerald said.

Connections

These elements make up Wal-Mart's network:

LANs: Assorted Token Rings.
Satellite connections: Hughes Network Systems Personal Earth Stations.
Protocols: TCP/IP, SNA.
Systems connected on LANs: IBM 3090s, assorted Unix servers, Teklon 960 handheld PCs and POS terminals.
Network management: SNMP.
Routers: From Cisco Systems, Inc.
Hubs: From Synoptics Communications, Inc.

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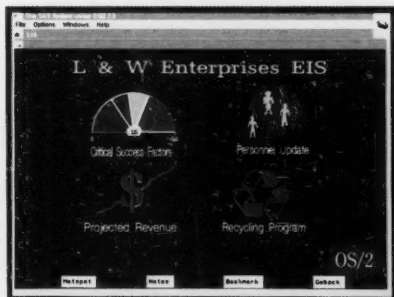
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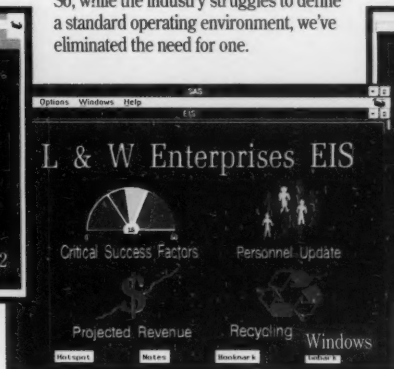
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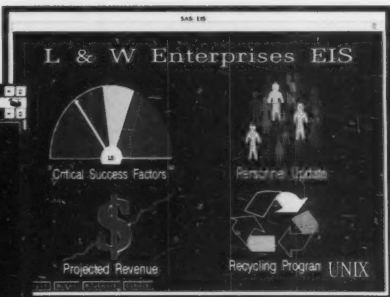


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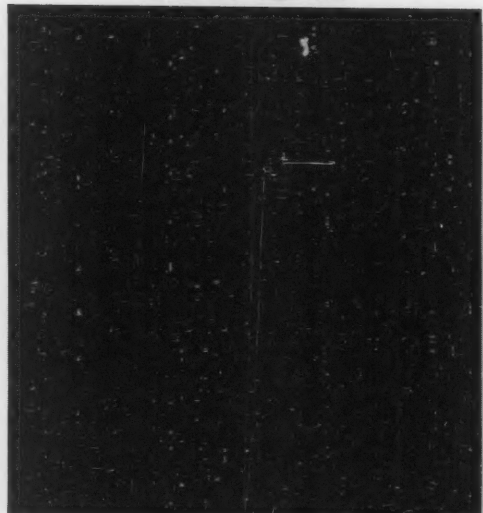
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*Comparisons based on switched services of leading national carriers. **Data Communications Magazine User Survey—Private Line Services, August 1992.

Clinton regime to speed tech highway

CONTINUED FROM PAGE 1

work services to all of America.

Using private digital infrastructures, a number of large companies have improved quality, lowered costs and shortened time to market, according to Craig Fields, chairman of the Microelectronics and Computer Technology Corp. in Austin, Texas, who spoke at the hearing.

A more far-reaching "data super highway" would boost the nation's economic competitiveness, aid the growing population of mobile computer users and promote socially worthy goals, most observers agreed.

However, inhibiting development of the high-speed digital network that Gore sees as all-fiber by the year 2015 are competing views on how the infrastructure should be built, by whom, when and at whose expense. To date, the Clinton administration has offered few implementation and regulatory details.

In no hurry

That is OK with some corporate users who are wary of any government participation at all.

"I don't think it's government's business to get involved," said Michael Higgins, who oversees telecommunications at Byer California, a clothing manufacturer in San Francisco. "Virtually nothing the government controls runs well. [The infrastructure] should probably be

managed by a consortium" of companies, as is today's education- and research-oriented Internet, he said.

"Gore wants [the network] to be publicly owned," said Joseph S. Kraemer, national industry director of the Telecommunications and Electronic Services practice of Deloitte & Touche in Washington, D.C. "But if Clinton is serious about cutting the deficit, it is not clear why you would substitute public for private capital." He added that the infrastructure will require closer synergy between federal and state regulatory bodies.

In a similar vein, carriers generally want the government to limit its role to funding research and network trials. At President Clinton's Conference on the Economy last month in Little Rock, Ark., AT&T Chairman Robert Allen said, "I think the government should not build and/or operate such networks. I believe the private sector can and will be incented to ... make it possible for people to connect with ... information anyplace in the world."

But the federal government should at least "articulate a vision and adopt policies consistent with it," said Mitchell Kapor, chairman of the Electronic Frontier Foundation (EFF), a Washington, D.C.-based organization that provides counsel on social and competitive issues arising from technology.



Mitch Kapor: Helping to create vision and high-tech policy

A healthy diet

While the industry argues over the concept of a national data superhighway, fiber deployment in the public long-distance network is proceeding nicely via the invisible hand of competition.

Of the 90,000 telephone network miles collectively run by AT&T, MCI Communications Corp. and Sprint Corp., 61,600 of them are fiber. The carriers' fiber lines, which have a much higher traffic-carrying capacity than copper wiring or microwave links, are supporting an average of 95% of the carriers' customer network traffic.

In addition, Sprint last week announced it will spend more than \$500 million during the next five years deploying a Synchronous Optical Network infrastructure—a fiber transport technology initially running at 600M bit/sec. speeds.

Delivering fiber services to fringe locations via subnetworks from the regional telephone companies is a greater challenge.

For example, while RBOC backbones are collectively about 75% fiber, just 15% of RBOC feeder lines out to smaller central offices are. And there is next to no fiber running from feeder switches to the home.

According to Laird Walker, vice president of federal relations at US West, telephone companies will have to spend \$200 billion to \$300 billion more than their planned capital budgets to roll out a ubiquitous fiber-optic network. That amount should be covered at least in part by higher user costs.

Walker said rates could be comparable to the \$30 to \$40 most Americans pay each month for cable television.

US West's executive vice president of mass markets and operations, Thomas Bystrzycki, also warned that federal mandates for widespread fiber network construction could result in a misappropriation of resources in areas where services are not yet needed. — Gary H. Anthes and Joanie M. Wexler

Computer companies, which are not subject to regulation, nevertheless agree with Kapor. Without knowing the government's views, Apple Computer, Inc. Chairman John Sculley, who testified at last week's hearing, said, "If the private sector doesn't know ... the government's position on security, privacy, access, First Amendment rights and intellectual property issues, then obviously that limits our enthusiasm to invest."

Clearly these issues must be resolved before the technology challenges of blending protocols, networks and equipment can begin.

Meanwhile, the EFF is not content to wait a decade or more for fiber everywhere. It is drumming up support for an interim narrowband Integrated Services Digital Net-

work support behind the EFF proposal. Last month, Markey said ISDN could save billions of dollars in health care costs during the next two to three years by streamlining patient data, claims processing and inventory control processes.

Specifically, Arthur D. Little, Inc. said widespread adoption of telecommunications and information technology could reduce the cost of health care in the U.S. by \$36 billion a year.

Meanwhile, the RBOCs are planning an assault on Capitol Hill this year to remove the cable television ban and other restraints placed on them during the AT&T breakup. They want their fair share of the infrastructure pie.

Countering their efforts is Rep. Jack Brooks (D-Texas), chairman of the House

Judiciary Committee, who last year sponsored legislation to bar the Bells from offering information services. His bill failed, but he is likely to try again this year.

There are other political barriers. Newspaper publishers, for example, argue that a sprawling electronic information network would constitute unfair competition. Also, it is unclear today whether local access to a nationwide broadband digital network will eventually be provided by the phone companies, cable TV companies, wireless network providers, another entity or all of the above.

The new Federal Communications Commission chairman—not yet named by Clinton—will be a key figure in resolving these issues. John B. Lynn, chairman of the telecommunications public policy committee of the International Communications Association user group, said the commissioner will face a difficult balancing act setting appropriate regulations while promoting competition and protecting users from monopoly practices.

Some have said the fight for the infrastructure is not a technology winner-take-all proposition. "I used to think the country could only afford to do it one way, but I've totally abandoned that," said Michael Roberts, networking vice president at Educom, a 600-member association of colleges and universities.

Clearly, no road map for the information superhighway exists yet. However, the combined forces of commercial interests, user needs and an administration strongly committed to the concept make it likely that one will begin emerging this year, perhaps as soon as Gore and a new FCC chairman have unpacked their bags.



Al Gore would like to build a coast-to-coast electronic information highway

Lukewarm response

WHILE COMMUNICATIONS PROFESSIONALS AGREE WITH THE CLINTON/GORE PROPOSAL TO HAVE FIBER-OPTIC CABLE IN EVERY BUSINESS BY 2015, THEY ARE ONLY IN SLIGHT AGREEMENT THAT CLINTON AND GORE WILL TAKE ACTIONS FAVORABLE TO USERS

Scale: 1 to 5, where 5 is 'strongly agree'

Fiber-optic cable should be in every business **4**

Clinton and Gore will take favorable actions **3**

Response base: 111 network and telecommunications professionals

Source: Computerworld Database Division

work (ISDN) infrastructure. Dial-up ISDN runs over today's telephone lines at speeds of up to 1.5M bit/sec.

The Consumer Federation of America said narrowband ISDN could bring 80% of the benefit of broadband fiber optics to the home at 10% of the cost. EFF and others said it can be made ubiquitous in three to five years without massive investments.

Bell Atlantic Corp., for example, already plans for 87% of its lines to be ISDN-capable by 1994. Several other regional Bell operating companies plan to have 50% to 70% of their lines ISDN-capable in the same time frame.

Some users consider this viable. "As a corporation, we're committed to ISDN basic rate"—1.44K bit/sec., said W. Edward Hodgson, manager of computing and communications at Schindler Elevator Corp. in Morristown, N.J., and chairman emeritus of the North American ISDN Users Forum.

"If we had that to all locations, we could get services that today we have to fight for," such as putting modems in employees' homes and desktop conferencing, Hodgson said.

The influential Markey and a number of computer companies have thrown

Local telephone companies' plans to deploy narrowband ISDN—a proposed interim national infrastructure—by 1994 range from 21% of US West lines being ISDN-capable to 87% in the Bell Atlantic region.

HOW 4D BECAME CA'S NIGHT WORST MARE

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GARTNER GROUP

Seemingly overnight, one company has come to dominate the MVS automated operations software world. And that one company, 4th Dimension Software, is converting more companies from CA's automated operations products than all the others — over 600,000 jobs converted from CA-7 in the last year alone.

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4D

4th DIMENSION SOFTWARE INC.

Bush Presidential Library first to employ high tech

By Mitch Betts
WASHINGTON, D.C.

As "Clinton Platter No. 1" was inserted into an optical jukebox at the White

House correspondence office on Inauguration Day last week, the 12-in. optical discs holding the outgoing Bush administration's correspondence were carted off to the National Archives.

Eventually, the Bush platters will go to the George Bush Presidential Library and Museum in Texas, where planners hope to build a sophisticated multimedia system that will allow Bushophiles to see correspondence, polls, press reports and video clips on computer workstations.

The multimedia system "will change the way people do research," said George C. Edwards III, director of

the Center for Presidential Studies at Texas A&M University, where the Bush library will be located.

People analyzing the 1992 election, for example, could retrieve campaign strategy documents, see the television ads that grew out of that strategy and then review polling data to see how the public reacted, Edwards said.

The electronic archives will also be available to researchers across the country via the Internet or the planned National Research and Education Network if all goes according to plan, he added. Construction of the Bush library is expected to start in 1995 and be completed in 1997.

Much work to be done

Edwards said he has discussed his vision with vendors such as IBM, Xerox Corp. and Apple Computer, Inc., but the library is far from being ready to sign a contract. One of the biggest challenges the project now faces is how to index and store thousands of videotapes for fast retrieval on multimedia workstations, according to Edwards.

The scanning of unclassified correspondence into the optical disc system by the White House correspondence office was a key step toward creating the electronic library.

The digital images often include attachments and handwritten notations from various officials who have reviewed the correspondence.

The 5-year-old optical archive was poorly maintained and was plagued by a variety of problems, so the White House hired Mastech Systems Corp., a Pittsburgh systems integrator, for a complete overhaul.

In the last six months, the firm replaced faulty software and upgraded the servers on a network that includes 80 Unix-based workstations, according to Mastech project manager John Sparhawk.

It appears that the Bush library will also be getting thousands of computer tapes holding the electronic mail of the Bush White House [CW, Jan. 11]. A federal court has ruled that the backup tapes must be saved, although the Bush administration has appealed the ruling.

Edwards said he is looking forward to getting the E-mail archives, but he added that "historians will have to learn how to use it. We're not used to dealing with correspondence at that level of intimacy."



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Library rivalry

The Bush library will be the most high tech of the presidential libraries. While the Reagan library has an electronic index of documents, the documents are not in a database. The Bush library will be built with privately donated funds on a 90-acre site in College Station, Texas. The cost is estimated at \$87 million.



To PC, But Which PC?

That Is the Question

Let Benchmarks Play a Leading Role in Your Decision

There was a time — not too long ago — when the idea of a personal computer on every desktop was farfetched. Soon, the technology became available, but the cost was prohibitive. Today, the number of computer vendors marketing their brand of PC is increasing at a dizzying rate. The result? Higher-quality machines at lower prices. Plus, some tough decisions for you.

Studying specific benchmarks can help as you decide which PC is right for your business. In fact, there are several PC benchmarks that can be used to differentiate systems from model to model and vendor to vendor.

Benchmarks, highly visible and widely quoted, are a less than perfect yardstick for measuring PC performance. At the very most, they're only a test designer's best guess at emulating what you're really doing on the computer. However, whether you're buying a PC to use as a stand-alone, as client, as server, or in a networked environment, benchmarks can be quite relevant to your purchasing decision — as long as you select those that are most appropriate for your business.

Your computing environment — whether traditional MS-DOS or Windows — will play a key role in the benchmarks you choose. Although several benchmarks are fine for both environments, there are some that are strictly windows-based. It's also important to choose benchmarks that make comparative ratings available. Unlike benchmarks in the UNIX arena, most of the widely used PC benchmarks have been created and maintained by magazines and independent testing labs. So, don't hesitate to ask for the source of benchmark results.

Critical areas of measurement for stand-alone PCs include: CPU, disk I/O, graphics, floating point unit (FPU), and applications. For a networked PC, the network interface also becomes important. Let's take a closer look at specific benchmarks in each of these categories.

CPU

CPU benchmarks measure the speed of the central processing unit (CPU) and may be

paired with single measurements of other components, such as a graphics processor, disk, or network interface. Specific CPU benchmarks include:

• PC Bench (PC Magazine)

This benchmark suite provides application-based benchmarks in several desktop areas, including word processing, spreadsheet, and database. (Metric: DosMark, WinMark)

• **Norton Sysinfo V6.0** (Norton SI from Symantec/Peter Norton Computing Group)
Norton V6.0 refers to the sixth version of the Norton Utilities, a collection of programs that enhance your PC's capabilities. Sysinfo refers to a specific utility measuring performance through two tests: System Index (SI) for CPU speed, and Disk Index for disk speed. A third aggregate index averages the two test results together. (Metric: SYSINFO)

• Dhrystone

This benchmark measures integer processor and C, Ada, or Turbo Pascal compiler efficiency. (Metric: Integer MIPS)

• iCOMP (V1.0 from Intel)

The iCOMP benchmark is new and represents Intel Corporation's first attempt at providing a comparison of their CPU chips in terms of performance. The iCOMP index is a weighted mean of the results of other CPU benchmarks, including ZD Lab's CPU benchmark, Whetstones, SPECint92, and SPECfp92. The iCOMP index is scaled so that a 25 Mhz 486sx is rated at 100 iCOMPS.

Graphics

Graphics benchmarks are usually relative to an imaginary system and are expressed as single metrics for one or more graphics options. These benchmarks also contain elements of window management, pure graphics, and character manipulation. They include:

• WinBench (PC Magazine)

WinBench is a windows-based graphics benchmark that measures not only the performance of graphics operations, but also the effects of disk caching under windows. (Metric: Winmark)

• WinTach (Texas Instruments)

WinTach is also a windows-based graphics benchmark. Its RPM rating provides a composite of four test scores, including word processing, CAD/DRAW, spreadsheet, and Paint Windows applications.

• PC Bench

Applications

The earliest benchmarks available concentrated on raw CPU speed. Today the trend is to test the actual environment and simulate or even use the actual application to test systems.

Application benchmarks include:

• SYSmark (Business Application Performance Corporation)

With the SYSmark suite, you're provided with actual application-based benchmarks in the areas of word processing, spreadsheet, database, desktop graphics, desktop publishing, and software development. (Metric: Individual SYSmark in each category, overall aggregate SYSmark)

• WinTach

Network

These benchmarks measure network performance. Specifically, some measure the performance of the network interface card, while others test throughput of the server system, usually determined by a combination of CPU, NIC, and disk performance. Network benchmarks include:

• NETbench (Ziff Davis Labs)

NETbench consists of three benchmarks that focus on CPU throughput with the metric in transactions per second, Network Interface Card (NIC) throughput in bits per second, and I/O throughput in bits per second.

• Norton Sysinfo V6.0

Disk I/O

With the advent of caches on disk controllers and software disk caches, these benchmarks tend to measure more than just raw disk performance. Some measure at the application level; others measure at the operating system level. Still more measure attributes of the disk system. Disk I/O benchmarks include:

• CORE (V2.8 from CORE International)

The CORE benchmark measure attributes of the disk system, including transfer speed and track-to-track times, through standard metrics, such as data transfer in Mb/s.

• Norton Sysinfo V6.0

• PC Bench

Floating Point

These benchmarks measure the FPU, usually associated with the 80 × 87 coprocessor instruction set. However, since most PC applications do not take advantage of floating point, there aren't many "typical" application-based FPU benchmarks. Those that exist include:

• Whetstone

Written in Fortran, the Whetstone benchmark measures single- and double-precision integer processor and compiler efficiency. (Metric: KWIPS or WIPS)

Beware the Changing Face of Benchmarks

There are two important ideas to remember when selecting PC benchmarks. First, the results of different versions of benchmarks should not be compared. Benchmarks evolve along with hardware and software and may change significantly with each new version.

Second, beware of benchmarks created by manufacturers. Naturally, they will represent their own product in the best light. Actual use may not exhibit similar increases in performance.

For benchmark or product information on Digital's DECpc family of personal computers, call 800-PC BY DEC (800-722-9332) and reference priority code ZNG.

MIGRATION

to Digital Platforms Ensures a
BRIGHT COMPUTING FUTURE

To get an accurate read on the changing face of the computer industry, glance at the headlines. Mergers, buyouts, and shutdowns of major computing firms continue to be front-page news — news that is of major concern to you as you plan your business' computing future. As the headlines get bolder, you may need to reevaluate your options and redefine your computing strategy.

Whatever your situation is, Digital is prepared to deliver on a critical promise: we won't abandon your business.

The proof is in our ability to provide a long-term, stable computing environment, a 25-year architecture with Alpha AXP, database and graphics capabilities, and a clearly defined way to get there. Together with recognized software vendors, Digital will provide the hardware products and conversion software tools you need to migrate to VAX OpenVMS, OSF, or Alpha AXP platforms. In short, we offer you a total migration solution.

Good News for Prime Customers

Prime Computer, Inc. customers have a lot on their minds these days. Their vendor of choice has withdrawn from the hardware market and will no longer be marketing its minicomputers. However, there is light at the end of this computing tunnel.

By migrating to a Digital platform, you get security, a pathway to the future, and much more, including:

- The unbeatable performance of our full range of hardware — from desktop to data center, UNIX-only, OSF, or UNIX plus OpenVMS systems.
- More than 2,000 third-party software applications (and the list continues to grow).
- Digital's 100% commitment to the UNIX platform.
- Comprehensive, worldwide service and support.

Digital offers Prime customers what they need today. In fact, at December's DECUS gathering, a number of software applications, including ANSYS and ORACLE, were success-

Digital offers
your business
technological security and
superiority today —
plus a clear and defined
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future computing.

fully ported from Prime systems to Digital's open systems. What's more, our migration solution is extensive — covering areas such as coexistence, networking, peer-to-peer applications, and maintenance.

For information on Digital's Migration Solutions, call 800-DEC-INFO (800-332-4636) and reference ext. 199.

Digital's PrintServer 32
Printer Is Making a Great
Impression

That's right. Digital's PrintServer 32 printer — a 32-page-per-minute departmental laser printer — has received enthusiastic response at recent industry trade shows. Plus, industry analysts predict an annual growth rate of more than 12 percent for printers in this 26- to 50-page-per-minute category. PrintServer 32 printer features include the ability to:

- Print up to 150,000 pages per month
- Offer high-capacity paper-handling options
- Run software that allows Sun SPARCstation users to gain access to high-speed printers.

And, don't forget about the 20-bin mailbox option that allows one or more users to pick up print jobs from assigned bins — putting an end to print job searches and the reprinting of "lost" jobs.

Order #	Product	Price
LP532-AA	PrintServer 32 printer (Simplex)	\$20,995
LP532-CA	PrintServer 32 printer (Duplex)	\$22,995

To order Digital's PrintServer 32 printer, call 800-DIGITAL (800-344-4825) and press 1.

Xilinx to Port to Alpha AXP Platforms

Xilinx, Inc., headquartered in San Jose, California, recently announced plans to port its XACT development system software to Digital's 64-bit Alpha AXP RISC platforms/systems. The XACT development system places, partitions, and routes designs for Xilinx field programmable gate arrays. XACT will work with the UNIX-based operating system for the XC2000, XC3000, and XC4000 devices.

Xilinx is the world's leading supplier of CMOS programmable logic devices and the market leader in field programmable gate arrays.

For information about XACT running on Alpha AXP RISC platforms/systems, call Peter Gregg, Xilinx, Inc., at 408-879-5019.

FASTship Menu Serves Up Spares

Over 4,000 spares — representing more than half of all of Digital's spare products — have been added to our FASTship menu. With these additions, all of our popular parts, with the exception of kits and 6xxx CPUs and memory, can take advantage of Digital's FASTship Service.

All FASTship orders will be shipped within 24 hours of order placement. All products not on the FASTship menu will continue to have a 7-day lead time for piece parts, and a 14-day lead time for kits.

To order Digital spare products via FASTship Service, call 800-DIGITAL (800-344-4825) and press 1.

GE Computer Service: Success with
MIGRATION Digital and Unidata

For GE Computer Service (GECS), a leading provider of comprehensive, multivendor computer maintenance service and equipment rental, ensuring quick resolutions to customers' problems is critical. That's why the Norcross, Georgia-based company began to investigate new computer hardware when it reached full capacity on its existing system in 1991.

What was needed was a scalable computer system to form the foundation for future growth. GECS looked to Digital for the solution — and found it. The company selected Digital's VAX 6000 system because of its increased capacity and processing functionality. In addition, a cluster of VAX 6000 systems was selected to serve as the host system, providing increased power and flexibility to accommodate GECS' business expansion.

In addition, GECS saw the OpenVMS operating system as a more suitable platform than a client/server UNIX-based system on which to run the company's mission-critical dispatch applications.

The next challenge: to convert DART to OpenVMS without disrupting established

procedures or creating system downtime. DART, the company's integrated Call Management System, was originally developed in a PICK-based system to take advantage of Pick System's strengths in commercial applications.

GECS began researching technologies that would keep DART intact but allow the application to take advantage of Digital's VAX architecture and OpenVMS operating system. The company selected Unidata, Inc., a Digital third-party partner, to provide the critical link between GECS' existing system and the new Digital environment.

"A key element in our initial selection of Unidata was our ability to maintain the same look and feel throughout the entire application," said Jim Schneider, Manager, DART Application Development, GECS. "We were amazed at how easily our PICK BASIC programs and our Report Paragraphs were converted to Unidata."

All in all, the Digital/Unidata partnership provided superior hardware technology and robust RDBMS to ensure the viability of the GECS' DART system well into the future.

"Our experience with Digital has always been excellent, but this project really gave us an appreciation for the value a highly motivated sales and support organization can offer."

Dave Stock, Manager, Computer Operations
GE Computer Service (GECS)

The ALPHA AXP ANGLE

Digital's Alpha AXP technology — based on an advanced 64-bit RISC architecture — will provide users with a major increase in processing power and addressability at an affordable price. So what's in store for the future? Quite possibly, newer, more powerful applications and styles of computing that have yet to be imagined.

Many of "yesterday's ideas" are things we simply take for granted today, like the automobile, the telephone, the VCR. Ideas that have enhanced our capabilities and that have made our lives easier and more productive.

In computing, it's the same story. Emerging technologies will bring about a major paradigm shift in the way people use computers. Multimedia, speech recognition, imaging, and other technologies will enable the computer to work the same way people work to accomplish non-computer tasks today. These technologies will permit even the most casual user to access powerful information storage and manipulation capabilities.

In fact, the application of computing is about to experience the same leap that took us from mainframes and 16-bit minicomputers of the early 1970s to the 32-bit microprocessors of the mid-1980s. This leap ushered in the age of desktop computing with windowing user interfaces. Affordable 32-bit microprocessors facilitated development of new classes of applications, such as desktop publishing — a capability taken for granted today.

What, you may ask, will stimulate the next technological leap that brings us applications of the future? The answer is an advanced, 64-bit RISC architecture — an architecture that provides for unlimited growth into the 21st century by offering dramatically increased performance and addressing capabilities. Digital has given it a name: Alpha AXP.

64 Bits: Enhancing Today's Applications, Facilitating Future Computing Styles

The Significance of a 64-bit Computing Architecture

The combination of speed and enormous addressing capability will be required to run the next generation of high-impact applications. Digital's 64-bit Alpha AXP architecture is the industry's first to offer both features — enabling you to run applications faster, with increased detail, and at a reduced cost. With Alpha AXP, the power of the super-computer will be made affordable and available on the desktop.

Another key difference between Alpha AXP and first-generation 32-bit RISC architectures is longevity. For a computer architecture, longevity is based on three requirements: addressability, support for multiple operating systems, and scalable performance. Digital's Alpha AXP technology offers all three:

- 64-bit addressing capability
- Support for UNIX, OpenVMS, Windows NT, and operating systems to be developed in the future
- Performance that's scalable by a factor of 1,000 during the next 25 years.

Digital's first-generation Alpha AXP systems have already established new high-water marks for RISC system performance. Benchmark figures include:

- SPECmark89: 184
- SPECfp92: 200
- SPECrate_fp92: 17187

In fact, competitors' sixth- and seventh-generation 32-bit systems — perhaps at their peak performances — have already been surpassed by first-generation Alpha AXP systems.

Alpha AXP: Imagine the Possibilities

No matter what business you're in — from financial analysis to aircraft design — 64-bit computing gives you the power to solve not only today's problems fast, but also more complex problems even faster. For example:

- The enhanced speed and addressability of Alpha AXP will allow pharmaceutical companies to rely on the accuracy of computer modeling technology to enhance the work of the bench chemist. Alpha AXP will enable scientists to model more complex molecules over a longer period of time — and will ultimately shorten a drug's design, development, and approval cycles.
- The addressability of Alpha AXP can drastically improve the productivity and efficiency of the documentation process at power plants. For instance, searching for information through reams of microfiche and paper cartons is a time-consuming process. With Alpha AXP technology, volumes of documentation can be brought online and into memory — making the search process easier and tremendously efficient.
- Just as technological advances of the past have facilitated new styles of computing, so the Alpha AXP RISC architecture will be the catalyst for applications of the future, including voice integration and virtual reality. For example, Alpha AXP capabilities will make transcription from audiotape a thing of the past. In the healthcare industry, physicians' notes could be transcribed automatically in real time via speech recognition at a workstation.

Alpha AXP Versus IBM: Digital Wins on Price and Performance

CERN, the European Nuclear Research Center located near Geneva, Switzerland, has developed a set of benchmark tests that help its staff select computer systems. The CERN benchmark suite tests a broad range of system capabilities.

So, how did Digital's Alpha AXP system fare when compared with an IBM offering? On the CERN benchmark suite, the DEC 7000 AXP — at a U.S. list price starting at \$168,000 — rated 23.6 CERN units of performance. On the same benchmark, the IBM ES9000 mainframe — at an entry-level price of \$4.8 million (plus extra for the operating system) — scored 20.3 CERN units of performance.

In short, the DEC 7000 AXP delivers 16 percent more performance than the IBM ES9000 at 4 percent of the price.

Use Fast FAX Service to Get the Facts on Alpha AXP

Digital's "Alpha AXP Fast FAX Service" enables Digital customers to order literature and receive it within minutes using a Touch-Tone telephone and fax machine (in the U.S. and Canada), or a fax machine and attached phone (outside the U.S. and Canada).

Simply dial a telephone number specific to your calling area and then follow a series of voice prompts to select and order documents you want. You then receive the literature through your fax machine a few minutes after you hang up.

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Digital's NAS Integrated Software Opens the Door to Sun

Digital has simplified
multivendor computing
at Sun sites with our

**Network Application Support (NAS)
250 for SunOS SPARCstation
product — enabling SunOS users
to easily integrate applications
across a variety of vendors'
platforms.**

Like all NAS products, the NAS 250 for SunOS SPARCstation product simplifies multivendor computing by providing a common layer of software that shields you from underlying differences among operating systems. As a result, NAS can streamline access to data and information across different computing platforms, such as MS-DOS, MS Windows, Macintosh, UNIX, OS/2, OpenVMS, and IBM platforms.

The NAS 250 for SunOS SPARCstation product integrates three software components, all based on open industry standards. They include:

DECwindows Motif

DECwindows Motif is Digital's OSF Motif-based software that provides a common user interface optimized for high-resolution displays on a bit-mapped SPARCstation. It also includes features, such as online help

facilities, structured visual navigation, customization of windows, and support for Asian and multinational character sets.

Application Control Architecture (ACA) Services

ACA Services is software that enables you to effectively integrate distributed applications and information easily, using object-oriented technology.

Compound Document Architecture (CDA) Services

CDA enables you to store, transport, and interchange compound documents in a multivendor environment. NAS 250 for SunOS SPARCstation software is also server-enabled — allowing access from other SunOS SPARCstations in the network as clients or peers.

Order Information

NAS 250 for SunOS SPARCstation Software
01-06HAI-3B
\$265

For information on any of Digital's NAS software products, or to order NAS 250 for SunOS SPARCstation software, call 800-DIGITAL (800-344-4825), press 2, and reference ext. 69F.

NAS Success in Pueblo County

Using NAS 300 Integrated Software from Digital and GIS software from Environmental Systems Research Institute (ESRI), Inc., Colorado's Pueblo County is building a GIS Center — a general query system for county agencies, based on data from property records, parcel boundaries, census data, aerial photography, and associated land records.

NAS-based SQL Access services allow users to create direct links to information without needing to know where it resides. The CDA architecture of NAS allows users to create and share compound documents using different data types, such as bit-mapped and vector graphics, maps, and text.

NAS 300 also enables personnel to automatically trigger events from one department to another via DECmessageQ. For example, if a lien is filed in the clerk's office, DECmessageQ will trigger an alert in the records department. This, in turn, may trigger a flag in the treasurer's office that tax payments are delinquent — thereby preventing a deed from being recorded.

All told, NAS features enable employees from different agencies within the county to link to ESRI's GIS database, located on a DECsystem 5000 server — allowing easy access to sharing, locating, and storing information. Since the GIS Center is strategically located with a combined Emergency Dispatch Center for the city and county of Pueblo, virtually all NAS 300 components will also be used by 1994 to support valuable emergency response applications.

"NAS 300 allows us to integrate our PCs, UNIX systems, and VAX systems, and share our GIS (Geographic Information Systems) among multiple departments. In addition, we can share X.400 mail between our PCs, UNIX systems, VAX systems, and our IBM AS/400 systems — providing greater information sharing between departments."

Gerald Carleo, Director
Information and Computer
Systems
Pueblo County, Colorado

Digital Opens Network Printing Software to HP and Apple PostScript Printers

With DECprint Supervisor for OpenVMS

With DECprint Supervisor (DCPS) for OpenVMS, Digital expands its printing support to include popular third-party PostScript printers in the OpenVMS and PATHWORKS environments — including several models of the Apple LaserWriter and the Hewlett-Packard LaserJet families.

With roots in DECprint Printing Services for OpenVMS, DCPS is layered software, offering powerful PostScript printing for your PC, Macintosh, workstation, and VAX OpenVMS systems. DCPS also increases "at the desktop" printer control, and adds sophisticated output features, including:

- Automatic data type detection and translation to PostScript of selected printer languages such as: DEC ANSI (PPL3), HP PCL, IBM ProPrinter, DDIF bitonal image, ReGIS, or TEKTRONIX. This feature also continues searching text data streams to detect and print appended PostScript data — greatly simplifying queue management and ensuring that documents are printed right the first time.
- Job status and printer condition messages for both users and system administrators.
- Number-up (N-up) and lay-up features that let you specify the number of page images per sheet as well as page placement on the sheet.

A three-product offering, DCPS allows you to tailor your printer support to suit your specific printing needs.

The first, DCPS-Base, drives Digital's line of PostScript printers, including our DEClaser 1152 printer — the world's first PostScript printer priced at under \$1,000. It outputs PostScript from PostScript or simple ASCII files, and supports all printer features, including tray selection and duplex printing. There's no cost for DCPS-Base, as its license is part of the OpenVMS license.

The second, DCPS-Open, lets you drive selected third-party printers, supporting all of those printers' features, and outputting PostScript from simple ASCII or PostScript files.

The third product is DCPS-Plus — offering value-added features, including number-up and lay-up, plus Automatic Data Type Detection and Translation. DCPS-Open and/or DCPS-Base are prerequisites for DCPS-Plus. Both DCPS-Open and DCPS-Plus require a license, with each CPU-based license allowing the operation of any number of printers.

All in all, the modular flexibility of DCPS offers maximum value. For a limited time, a special introductory price has been established for DCPS-Plus — providing even greater savings.

Order #	Product	Price
QL-09FA-AA	DCPS-Open	From \$350-\$2,324/CPU
QL-09LA-AA	DCPS-Plus	From \$50-\$100/CPU
QA-09NAA-H	Media/Documentation	\$285

*All CPUs in a cluster can print via a single CPU.

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Don't choose technology without him

Neal M. Goldsmith is a director of technology strategy at American Express Co.'s headquarters in New York, where he is responsible for a multimillion dollar research and development fund for the deployment of artificial intelligence systems across five American Express subsidiaries. He is one of five directors at American Express' Corporate Technology Strategy (CTS) group.

Goldsmith joined American Express in February 1989. Before joining the company, he was a research analyst at Gartner Group, Inc. in Stamford, Conn., and a senior research associate at AT&T's Technology and Productivity Center in Piscataway, N.J. He talked recently with Computerworld correspondent Thomas Hoffman.

American Express Co. is a \$25.76 billion diversified financial services firm. Industry analysts estimate its information systems budget last year was \$850 million.

Q: What's the mandate of American Express' CTS group?

A: To provide technical thought leadership to American Express and assist with technology strategy development for the business units. CTS also facilitates technology diffusion across American Express. In addition, the organization coordinates advanced R&D projects and manages strategic vendor relationships, especially with larger vendors such as IBM and AT&T.

Q: How do you select R&D projects?

A: Each summer, CTS circulates a memo to each business unit and corresponding Advanced Technology Group (ATG). The ATGs and user communities then discuss the business issues and R&D priorities of their organizations.

Then, the ATGs send a one-page proposal to corporate. The proposals include the application planned for R&D, the expected payoff from the technology employed and the net present value of the implemented application.

CTS then works with the business units to form cross-business unit R&D partnerships in order to capitalize on potential synergies and foster improved technology transfer.

After prioritizing the proposals, CTS sends its recommendations to executive management, which modify and then approve that year's selections.

Q: Is senior management involved in the selection of advanced technology projects?

A: Management is very involved. Our organization, which was launched in 1986, was the brainchild of [outgoing American Express Chairman and Chief Executive Officer] Jim Robinson. The corporate R&D fund encourages business units to invest long term in R&D, regardless of their quarterly or annual financial results.



David Evans

You really need someone with vision to champion the concept of R&D. Jim Robinson and [American Express President] Harvey Golub have been deeply involved in encouraging the technology innovation process. Senior management truly rewards technology risk-taking, which is one of the reasons the company is known as a trendsetter.

Q: How does your organization help the business units implement new technologies?

A: CTS focuses on three central issues. First, the technology itself has to be valid and appropriate. Second, we focus on what's important to the users.

Third, we look at current internal cultural and political conditions and whether the project fits the user department's budget.

We also look at the process of innovation and the barriers and aids to implementation. We involve end users—that's very important. The staff has to own the project, and department heads need to be convinced of the potential dollar payoff.

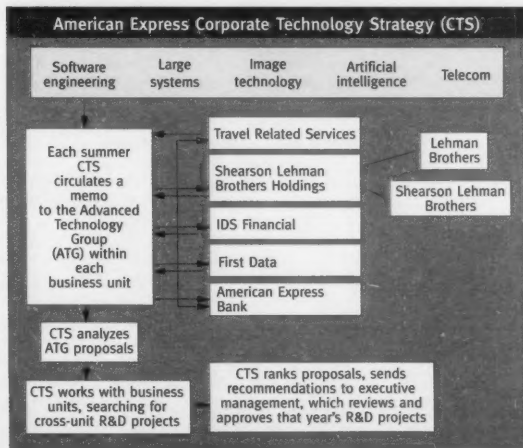
Q: Can you cite an example of a successful project?

A: Yes, the Authorizer's Assistant [an expert systems-based credit authorization system], which was developed in 1987 and was our first R&D project. It was wildly successful, and it saves American Express millions of dollars each year.

The system does the work of 700 human authorizers, who have either left or were reassigned within the company. That project was implemented by the Travel Related Services [TRS] subsidiary using software from Inference Corp. It is unlikely that this system would have been developed as early by TRS without corporate funding.

Q: What advanced technologies hold promise in the financial services sector?

A: Distributed applications, parallel processing and AI. Within AI, the most promising technologies are neural networks. Neural networks involve quantitative pattern recognition, which is what financial analysis is all about.



Turnaround

Can you think of a company whose mainframe revenue actually grew last year, by about 25% no less?

It is also a company that in a recent study ranked head and shoulders above its competition in mainframe customer satisfaction in Japan, where users are particularly demanding and quality-conscious.

Finally, this is a company that many people pretty much gave up for dead a short time ago, but which last week posted its fifth straight quarterly profit.

Among the companies that amassed and later lost fortunes in the last two decades selling proprietary iron, Unisys has engineered a turnaround that is impressive even to the most jaded of industry watchers. It is an accomplishment made all the more impressive by the seemingly endless tidal flows of red ink being hemorrhaged by IBM, DEC, Wang and others groping for bottom in an unforgiving market.

The accomplishments of Unisys and its chairman, James Unruh, hold excellent lessons for any business, be it a computer vendor, user company or anything else. And it comes down to this: Lose sight of your customer and you risk losing the entire enterprise.

Its customers, like all users today, clamored for more openness in systems architecture.

So Unisys "surrounded" its proprietary mainframes with integrated, Unix-based workstation solutions. This gave its mainframes the open characteristics that users wanted in a big server and arguably made its big boxes the most interoperable of any mainframe available. That's why Unisys sold more last year than the year before, and it expects to see more mainframe growth this year.

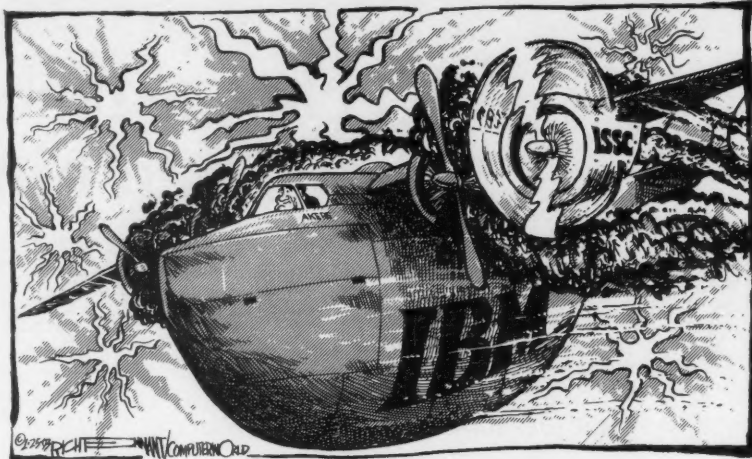
Unisys also emulated what the marketplace was doing by reducing the number of data centers in the \$8 billion company from 46 in 1991 to 22 today, with a goal of further reducing it to one within two years. That's a great way of seeing the world the way your customers view it.

Perhaps most importantly, a beaten, demoralized work force at Unisys — one that saw the number of employees drop from 120,000 five years ago to 55,000 today — was made to believe in itself once again. I visited the company 18 months ago when the mood was like a funeral parlor during a wake.

Today its top executives, whom I visited last week, are carrying out Unruh's mandate to methodically transform Unisys into a provider of open systems-based products and services, away from the mainframe legacy of its past. They seemed confident yet also humbled by the lesson they learned: Arrogance and smugness have no place in today's market. They realized the past is far gone and that a recovery can only be sustained if they meet the needs of their customers.

Bill Laberis

Bill Laberis, Editor in chief



Not true

Paul Gillin obviously has no idea what he is talking about ["Easy as 1-OS/2-3," CW, Jan. 11]. When he recommends installing OS/2's dual boot feature, he says "the dual boot requires repartitioning your hard disk, resulting in a total loss of all data on it." Nothing could be more false. As a matter of fact, dual boot requires that you already have data on the partition — namely DOS.

The fact that he also can't locate any OS/2 applications may mislead readers to believe that *Computerworld* writers don't bother to research a product before providing an evaluation.

Thane Smith
Tempe, Ariz.

thur heralds as the wave of the future is an echo of the past. Before software developers were enshrined into departments with huge backlogs, they could be found in symbiotic relationships with people who would one day be known as their customers.

Secondly, his ideas on paperwork prevention are criminal. I won't dispute that most project documentation is more useful when it's acting as a pedestal for my monitor. However, the disappearance of the programmer/customer relationship can be traced to the belief that documentation can be handled informally when only a few people are involved.

Quick, yes. Dirty, never!

Corey F. Huber
Cazenovia, N.Y.

Cite your source

In "Question everything" [CW, Dec. 28, 1992/Jan. 4, 1993] you state, "For every application rewritten in C or C++, the cost of software maintenance plummets compared with the cost of maintaining Cobol code." On what data do you base this statement? I have been looking for an authoritative, controlled study that quantifies the comparative cost of C and C++ to Cobol with little success to date.

The only study I've found compared the costs of developing in several languages, two of which were C and Cobol. This study discovered they were roughly equally productive for development.

Your article goes a long way to dispelling several costly, damaging myths. How ironic it would be if, in the same article, you would perpetuate another.

Preston W. Black
Cincinnati

Different opinions

The In Depth article "Quick and dirty" by Lowell Jay Arthur [CW, Dec. 14, 1992] was a wonderful description of the direction in which application software must evolve. His metaphors were not just entertaining; they very accurately model the way it is. I especially liked the creation/evolution metaphor: Do it quick, then let it evolve.

As vice president of professional services at Syscorp, I have overseen scores of PC network projects. All I can say to Mr. Arthur is "Amen!"

Thomas O. Meadows
Austin, Texas

Regarding Lowell Jay Arthur's ideas on "rapid evolutionary development," the process Mr. Ar-

People power

Michael Schrage makes some excellent points in his article "Bloodless revolution won't work" [CW, Nov. 30, 1992]. A key one is that "information doesn't create value — people do."

The ability to view financial statements 24 hours a day from home or office is worthless if the accounting is flawed.

For information to have value, people have to transform that information into knowledge by applying it with intelligence to a problem or a need.

There is, however, one area where Schrage perpetuates one of the most massive myths foisted on the business community by (mainly) computer companies. The simple phrase "information technology" is innocuous on the surface but has immense ramifications when accepted uncritically. I have seen no evidence that computer companies know anything about "information technology."

What they do know is how to move larger and larger quantities of bits and bytes faster and faster between more and more locations. That, however, is neither "information technology" nor "information management."

Marcis Esmits
Vancouver, British Columbia

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How vendors can die from downsizing

Marty Gruhn

During a recent trip to the East Coast, I sat next to the manager of worldwide support at a second-tier computer company whose problems have become legend. Our seatmate chat turned to the problems facing the computer industry.

"I'm watching the problems at DEC and IBM with some amusement," he began. "You know, both companies are facing real problems. They have to cut a hel-lacious number of employees, and I hear their organizations are in chaos. We, on the other hand, have already completed our downsizing and have those problems behind us. In fact, we should be profitable this quarter. You know, I heard that IBM..." He lapsed into a series of anecdotes about the missteps and mishaps of his largest competitor.

I felt like I was listening to a sailor from the Edmond Fitzgerald critique the design points of the Titanic. True, both ships sank, but thousands of the Titanic's passengers were saved. The Edmond Fitzgerald went down with all hands on deck.

What my seatmate didn't realize was that I knew the costs of his company's decisions. My

firm had been interviewing thousands of his customers — and those of other companies — who were living with the results of a downsizing decision. The carnage wasn't a pretty picture. Here's why:

The first reaction of most vendor companies planning to downsize is to deposit the president or CEO in front of a podium to promote downsizing as an event that will make the company leaner, meaner... and better for the customer. Forget it. History

shows that downsizing really results in organizations that are in shell shock for at least a year, usually longer.

Translated into customer terms, this means fewer people and resources, less responsiveness to problems and more aggravation.

The CEO's time would be better spent working on problems and talking directly to customers. If response times will go from four to 24 hours during the transition, the bad news should be on the table from the start. If the sales staff will become smaller, alternative ways to order products should be discussed.

Few vendors do this. Even fewer do the even smarter thing — talk to customers before the fact to see what products and services could be

cut back with little or no adverse result. If they did, the outcome would probably surprise them. In a recent study, we found that customers would accept a 50% reduction in service response time for a 5% cut in service costs.

Sure, the vendor would have to give up a little revenue in this scenario, but it could also downsize and centralize its service organization at a substantial annual savings and keep its customers happy. Even with downsizing, there's no such thing as a free lunch. If you cut products, services and responsiveness without some quid pro quo for the customer, the inevitable result is, you will have no customer.

And what of my seatmate and his boasts that his company has gone through the fire and emerged stronger and essentially unscathed? Well, I suppose he would have had more credibility if he hadn't told me that most of his customers are content with the changes (they're not), that the downsizing was successful (it wasn't) and that his mainframe accounts are going to ignore client/server (they aren't). But when he told me he had been at the same firm for more than 20 years, I understood completely. I turned out my light and went to sleep.



Gruhn is executive vice president of Alliance Development, a Scottsdale, Ariz., sales and marketing services firm.

Life won't be the same in a 32-bit world

FIRE WATCH by John Gantz

Sometime between Comdex/Spring '93 and Comdex/Fall '93, the number of 32-bit PCs in the world will equal the number of 16-bit PCs. In the next four years, the number of 32-bit systems shipped will top 100 million. The number of millions of instructions per second (MIPS) installed during Bill Clinton's first term will grow by a factor of 15 — faster than the deficit. We're talking about a couple of billion MIPS sitting out there in briefcases and on desktops in 1996.

This is why I have suddenly become bullish on 32-bit desktop operating systems and bearish on the information systems profession.

The main argument for 32-bit operating systems — IBM's OS/2 Release 2.0, Microsoft's Windows NT, a handful of Unices — is all this powerful hardware sitting out there ready to rock and roll and faced with the prospect of doing so with DOS. Would you want your family car running on baby buggy wheels?

There are other reasons too, such as the swift things you can do with program development tools and the marriage of GUIs with all this desktop power, but they are too technical to get into here.

Anyway, I only want you to buy into my first proposition so I can lead you into the box can-

yon of my second. And that is this: The IS profession is heading over a waterfall. Downsizing is a permanent thing. Here is my reasoning:

- New 32-bit operating systems, themselves a lot more complex than what users are accustomed to, will radically increase the requirement for remote-site, workgroup and division IS functionality. The same is true for new groupware applications (none of which are shrink-wrapped), network-based applications and network software.
- As this demand increases, organizations will compensate by consolidating central site resources and cutting headquarters' IS professional staff. The clever trick of off-loading the IS budget onto end-user budgets will backfire as the IS corpus under CIO or IS manager command shrinks to a small consulting staff.
- Top technical talent, always in demand, will flee to growth areas such as consulting firms, resellers and software companies.

If you think this is farfetched, then you didn't look beyond the numbers in last year's *Computerworld* Salary Survey [Sept. 7, 1992], which pointed out how IS salaries are actually going down. Nor did you understand the pathos of another front page story in that same issue — one about programmers unionizing.

Now here's the twist. I think the number of

individuals performing IS functions will increase as all this operating system and application complexity hits those follow 32-bit computers. But those individuals will come from a variety of sources and report to a variety of corporate departments and third-party organizations. A once-solid, stable profession will fragment and do so with the speed of a Pentium chip. To think, only a decade ago we were worried about the coming programmer shortage.

For individuals caught in the squeeze play, there are three options:

- Hone the high-demand technical skills left: networking and systems software design.
- Spearhead the charge into client/server computing for your company and gain job security



in the resulting confusion (see my column of Dec. 21, 1992).

- Dynamite the passes out of Silicon Valley and bottle up those quarter-inch mainframes coming out of Intel and Motorola.

Gantz is senior vice president of International Data Corp., where he is responsible for all research and consulting in desktop automation and workgroup and office computing.

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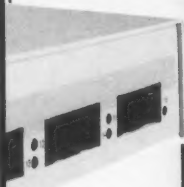
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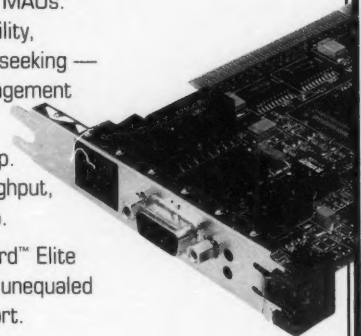
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Charles Babcock

Soft gains, secret savings



As many IS managers know, PC users scarcely finish congratulating each other on the bargain-basement hardware prices they find before the real costs of

ownership start to mount up. There's the hidden cost for support — \$6,000 or more per PC per year. There's the cost of networking. And a soon-to-be-released study from the Microcomputer Managers Association says there are hidden costs to moving to a graphical user interface.

Making invisible costs tangible and keeping a realistic tab is the mark of a good manager. What's often forgotten, however, is that savings gained should be tracked just as aggressively.

PCs can save money in unexpected ways, and given a realistic accounting of these savings, top management is more likely to sign off on the next investment.

One person who knows the value of keeping track of benefits as well as costs is Jim Coyne, senior vice president of IS at Acacia Federal Savings Bank.

In 1988, Coyne was commissioned to automate as much of the mortgage processing as possible at the Annandale, Va., savings and loan. He did so under considerable performance pressure. Overhead was outrunning revenue, and Acacia was losing \$1.2 million a year in only its third year of existence. He was also working under the gaze of a bank president "who believed computers and boats have something in common — they're both black holes for money."

Before he was finished, Coyne had turned this skeptic into a believer with a combination of good results and salesmanship.

What Coyne did wasn't terribly complicated. His results may not have been startlingly better than those obtained by other projects in other places. But what he did made all the difference. He paid attention to and made explicit the soft gains and hidden savings that technology people often overlook.

As Coyne told a Networkworld audience in Boston recently, he started small, with a NetWare LAN with a 300M-byte server and 11 386-based PCs. When employees described each step of their work to him, he was surprised to find that 30% of their jobs consisted of repetitive tasks that could be reduced or eliminated through the use of WordPerfect, Lotus' 1-2-3, a relational database and the file transfer capability of the network.

In an interview after his talk, Coyne described how the network flattened the organization in a way that has been de-

scribed in many *Harvard Business Review* studies. It wasn't part of the original network plan, but secretaries disappeared. People doing repetitive tasks disappeared. Middle management disappeared. The remaining jobs took on higher level responsibilities.

Accuracy also improved — mistakes carried through to mortgage closings declined precipitously. Coyne attributes the drop in misspelled names and mistated dollar amounts to "peer pressure."

The network made mistakes more trackable, a quality-control factor that no one had anticipated.

Acacia began processing loans more quickly, frequently beating competitors on the time needed to close. The tighter time frame narrowed the window of exposure to changes in rates, an area where an S&L can lose money on a deal.

As revenue doubled and the network expanded, Coyne carefully tallied the cost of the network in 1992 — \$350,000 —

and then compared that figure with what the company would have been paying in additional salaries if the number of employees had kept pace with revenue — \$650,000. He then shared these figures with the president.

What did that accomplish? Instead of talking about black holes, the president wanted to know, "Can't we do more with this technology?"

Babcock is *Computerworld's* technical editor.

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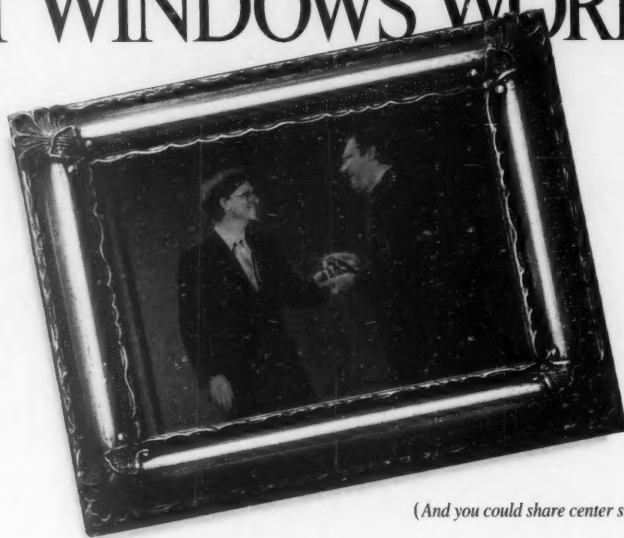
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- 70. Medical, Legal, Accounting Mgt.
- OTHER PROFESSIONAL MANAGEMENT
- 90. Educator, Journalists, Librarians, Students
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DEPARTMENTAL MANAGEMENT

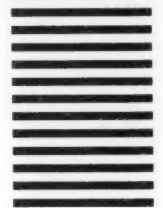
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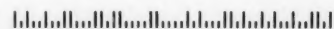
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Hardware confronts viruses

New solutions sought as number and variety of viruses challenge protection software

By James Daly

As the number of new viruses grows at an incendiary rate, information systems managers who want to keep their sanity and their jobs are increasingly looking for ways to ferret out and destroy rogue code.

The traditional method of fighting viruses with software-based scanners that search for known strings of virus code was acceptable when new viruses emerged every few months. Now, with new viruses being identified daily, security managers are questioning the traditional reactive software approach—detecting and eradicating primarily known viruses—and looking toward something new: hardware-based antivirus solutions.

Proponents say a number of protection techniques are made possible or more reliable by using an add-in adapter card. For example, the read-only memory on such a card has an opportunity to execute before the PC boots, virtually assuring a virus-free environment.

While traditional software scanners search for code strings to identify and eliminate known viruses, hardware does not need to know the specific virus in order to work.

"No product is going to catch every virus, but we like to believe we've made life harder for virus authors," said Anne Stewart, president of Warrenton, Va.-based JAS Technologies of the Americas, Inc., which is readying an add-on card called Virustrap. "We'd really like to put the virus authors out of business, and I think this is a step in that direction."

Secure circuitry

Virustrap, which will be manufactured by Texas Instruments, Inc., works by securing the circuitry of all the executable code on the hard disk. It detects and intercepts unwanted disk formats, blocks alterations of operating system files and stops all writes to protected areas on the hard disk.

Because no part of the program resides in random-access memory, Stewart said that no software attacks are possible. Virustrap, however, is not cheap: It will retail for about \$329 per PC when it is available in April.

Some of the other important products in this field include the following:

- Thunderbyte is one of the oldest hardware-based antivirus products on the market, having been on the shelves since 1990. It consists of an add-on card, a configuration program and a flat cable; the hard disk and controller are then patched through the Thunderbyte add-on card. Security levels are set by means of a dip switch on the adapter.

The product is effective because it is based on special algorithms that register any attempt to contaminate a program or data file. Although the product is RAM-resident, the vendor denies that it can be attacked by software in any way.

Thunderbyte was developed in the Netherlands and is now manufactured and marketed by Glynn International, Inc. in Brookline, Mass.

- An Australian-developed product called C:Cure, which will be marketed by Leprechaun Software International Ltd. in Marietta, Ga., is just about ready for release in the U.S. The \$229 C:Cure

sits on the cabling between the I/O port and the disk drive. According to officials, the device allows the user to partition the drive and

put all day-to-day .EXE and .COM files on one drive, which protects them from any modification.

- Digital Enterprises, Inc. in Gaithersburg, Md., has developed the V-Card, which protects systems from attacks on the boot sector, system and EXE files. It will sell for \$495 when it becomes available in late January.

- In November, Western Digital Corp. introduced a single-chip controller that uses proprietary antivirus circuitry to write-protect all areas of the hard disk containing the executable

code to which viruses tend to attach themselves. The WD7855 controller then monitors write operations to the hard disk and watches out for suspicious activity. It, however, is more a product for the OEM than the end user.

Hardware-based antivirus products are good, but they are not God's gift to IS executives. Critics contend that these boards seem especially vulnerable to virus writers because they can specifically write their virus to detect the presence of the board and circumvent it. Hardware proponents say that such logic is spurious; at the software level, it is analogous to saying that because a virus writer has access to a software antivirus product, it can be circumvented.

Analysts have given a thumbs-up to hardware-based virus protection. "It's a terrific idea," said Charles Rutstein, a virus researcher in Geneva, N.Y. But he also added some caveats: "Many of the cards are still too expensive," he added. "I see prices going down in the next year, but right now many of the manufacturers are just trying to recoup their investments."

"No product is going to catch every virus, but we like to believe we've made life harder for virus authors."

Anne Stewart,
JAS Technologies



Do not enter

While no antivirus product is 100% effective, hardware may have an edge. Here is how it works:

Essentially, hardware-based products protect specific areas of the hard disk, trapping generic calls that are frequently used by a virus. This is particularly effective for preventing boot-sector viruses. Antivirus software reacts to the presence of a virus, but hardware blocks the entry of the virus into the system.



Hardware-based virus protection

Pluses:

- Hardware protection cannot be circumvented by software.
- Viruses, known and unknown, are stopped prior to entering system.
- Does not require frequent updates.

Minuses:

- Board must be inserted in each PC individually.
- More costly than software; \$200 to \$500 per PC.
- May not be compatible with hard disks.

Still cheaper than downtime

One strike against hardware-based antivirus products is their cost. It is hard to justify spending upward of \$300 for virus protection on a machine, even in the best of times.

But Forensic Medical Advisory Services, Inc. (FMAS) in Rockville, Md., has found a way to ease that monetary pinch: It has equipped one PC with an antivirus card to screen all incoming floppy disks.

FMAS works as a subcontractor for the Department of Defense (DOD) as part of an extensive quality-control program. Several times a year, FMAS

sends staff members to military hospitals around the world to download randomly sampled patient records onto floppy disks and send them back to headquarters. The DOD then analyzes the gathered information to make sure it meets proper care standards.

It was a procedure that invited trouble. "In the past, we've inherited lots of viruses that cost hours of heartburn and heartache," said Allen Richards, a senior analyst at FMAS. A variety of software scanners frequently missed existing viruses, he added.

Instead, FMAS decided to equip two PCs with the V-Card from Digital Enterprises. The first PC serves as a screening machine, which every incoming floppy disk goes into without exception. FMAS staff members then "exercise the program," Richards said, running it through certain procedures to see

if a virus is trying to launch. A second card on an Everex Systems, Inc. PC is used as a file server; it serves a watchdog role.

The FMAS solution to the high cost of hardware-based antivirus devices is obviously

not for everyone in mainstream corporate America. FMAS has roughly 30 people in its IS department, while larger organizations may have hundreds. There are just too many floppy-brandishing employees and too much work coming over the networks to make it workable at many large IS shops.

But at FMAS, add-in cards have made a big dent in the virus problem. "The first time we got hit by a virus, it cost us a week's worth of work for eight people," Richards said. "I'd say it's cheap by comparison."

—James Daly

Security

RSA public-key encryption plan wins support

By James Daly
REDWOOD SHORES, CALIF.

A growing number of vendors have thrown their support behind a data encryption standard developed by RSA Data

Security, Inc. — a move that could significantly ease the ability of users to exchange sensitive data among different platforms.

At a data security conference earlier this month, officials from Apple Comput-

er, Inc., Sun Microsystems, Inc., Novell, Inc. and Unisys Corp. used varying degrees of specificity to describe upcoming products that employ the RSA standard. Digital Equipment Corp. and Lotus Development Corp. have already signed li-

censing agreements with RSA, with the latter integrating RSA's features into its workgroup software, Lotus' Notes.

"RSA needs market momentum to succeed, and I think you're beginning to see that here," said Ray Kaplan, an independent security consultant in Tucson, Ariz.

RSA's system, which was invented by three MIT mathematicians, uses what is known as a public-key design. It employs two keys, one public and one private. Data encrypted with the public key can be decrypted only with the private key. The use of two keys also creates what is known as a digital signature that can be used to prove authenticity.

This contrasts with the private-key Data Encryption Standard (DES), a government-approved algorithm for encrypting digital information that requires only one key for encryption and decryption.

Unbeatable algorithm

RSA gets high marks from security professionals for its sophistication; the algorithm connecting the two keys is so advanced that it is considered unbeatable. Perhaps the highest compliment for the RSA data encryption method has come from hackers, who now use it to scramble messages on dial-up bulletin boards that they fear are monitored by law enforcement personnel.

Novell engineer Kevin Kingdon said Novell will use RSA technology in its upcoming NetWare 4.0, which is expected in the first half of this year. "We're committed to the security of data and the security of interaction," he said.

Apple engineering manager Victor Chang said his company plans to integrate RSA's technology into Apple's upcoming Open Collaboration Environment (OCE), a system software extension that promises to foster growth in the Macintosh collaborative computing market. Chang said Apple hopes to provide a digital signature service that can be called by any application.

Although Microsoft Corp. and IBM mysteriously canceled their attendance at the two-day show, there are reports that Microsoft will implement RSA security features in Windows for Workgroups, Mail and the Windows NT operating system.

RSA President Jim Bidzos said the NT implementation could be the shape of things to come. "By 1995, many of the major operating systems will have public-key cryptography built into them," he said. "The need for this type of security is just too obvious to ignore."

To ignore, yes. But to do something about — that is another story. Although multivendor adoption of the RSA standard could ease the transfer of encrypted data, security experts said a cryptography system typically must clear hurdles imposed by management.

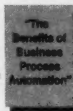
"The cost of administering the system is one of the biggest hurdles that RSA will have to clear," said Philip Chapnick, director of the Computer Security Institute in San Francisco. "The end users are going to have to convince management that those administrative costs are worth it, and that may take a while."

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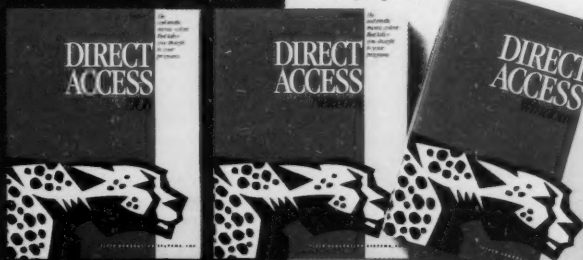
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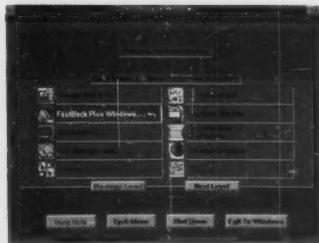
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FIFTH GENERATION SYSTEMS, INC

New hardware, software boost languid pen market

By Michael Fitzgerald

The pen market may be as slow as molasses in January, but it does continue to creep along.

While many projects seem to be stuck in perpetual pilot, some are coming to fruition, and vendors continue to probe the market. For example, Fujitsu Personal Systems Ltd. in San Jose, Calif., last week announced March delivery of a full-fledged pen-based tablet built almost entirely on 3.3V components for longer battery life.

At 3 pounds, the 325Point system will use two Personal Computer Memory Card International Association slots, which will run the cards for the company's Poqet Computer Corp. computer and PoqetPad.

Fujitsu said the system will run all the major pen computing environments on the market and will cost \$2,295.

Software front

There has been some activity on the software side as well. Pensoft Corp. in San Mateo, Calif., delivered Perspective, a \$299 personal information manager, 11 months after it was announced.

Also, Pen Pal Associates, Inc. in Los Altos, Calif., released Version 4.0 of its Power Pen Pal application development tool. It has added support for PenDOS, an operating environment from Communication Intelligence Corp. in Redwood Shores, Calif. It also has reportedly improved handwriting recognition and program development tools. It is slated to be available in March for \$995.



Vincent Ferraioli, senior systems analyst at Consolidated Edison Co. in New York and a Pen Pal user, said the product works well, but "our problem is hardware. We can't find any that can operate efficiently in the field."

Ferraioli said hardware in his environment has to be water-resistant and durable: One meter-reader's handheld computer came back with dog bites. He did credit vendors with being responsive to complaints, and he said pen technology "is great and will be very helpful in the utility business."

Analysts said that outside of new hardware, this burst of activity means little.

"The pen market has been hyped so much that whatever it does, people yawn," said Jeff Henning, analyst at BIS Strategic Decisions in Norwell, Mass.

Still, pen vendors said stronger sales in 1993 will help dim memories of the market's lackluster sales to date. They also defended the overhyped industry's slow start.

"We have to crawl before we can walk," said John Zeisler, a longtime veteran of Claris Corp. and Apple Computer, Inc. who is now president and chief executive officer at Pensoft. "I can remember struggling [at Claris] to define the horizontal market for desktop publishing when people didn't understand specifically how to use it."

"The pen market probably should be further along than it is — but by second half, things will start to pick up a little bit," predicted William Lempeis, publisher of "Pen Vision News," a newsletter based in Pleasanton, Calif.

Lotus to add mail services support to Organizer for Windows

By Michael Vizard
CAMBRIDGE, MASS.

Looking to integrate its graphical personal information software with electronic-mail services, Lotus Development Corp. has outlined a plan to integrate support for CC:Mail, Notes mail and other mail services with its Organizer for Windows software.

The support for mail services will allow Lotus to integrate group calendaring and scheduling with Organizer, which presents users with an interface similar to commonly used datebook organizers.

Scheduled to be available later this year, the Organizer software with E-mail services will make a product that is essentially stand-alone software into an application that can be used to schedule group meetings. By accessing the mail services, users will be able to set up various types of mail directories covering both private and public mailing lists.

Mail services support will allow Organizer for Windows users to set up various types of mail directories covering both private and public mailing lists.

Using the Vendor Independent Messaging programming interface specification, Lotus intends to integrate Organizer with other mail systems. It also plans to build separate gateways to link the software to large E-mail systems such as Professional Office System from IBM.

"Organizer is fairly simple to install and use. The people we've given it to have learned to use it without needing any of the documentation," said Monsour Zadeh, manager of systems and telecommunications at Pizza Hut International in Wichita, Kan.

"We've been using CC:Mail for a year and will incorporate it into Organizer when it becomes available," said Zadeh, who plans to purchase Organizer in large quantities following the end of the software's evaluation period.

"The response to Organizer from our users both here and internationally has been very strong," he said.

According to Barbara Baird, senior product manager for Organizer, the Lotus software differs from a traditional organizer product in that it lets users search for meetings, key words and names. "Traditional datebooks are good ideas, but try finding something in one of them once you've written it down," Baird said.

Lotus' Organizer is priced at \$149.

Untethered computing

Radio-frequency parts may make wireless shine

By Joanie M. Wexler
SANTA CLARA, CALIF.

National Semiconductor Corp. said it will announce today integrated components for radio-frequency-based communications devices aimed at overcoming some of the cost, weight and battery-life limitations of today's wireless networking options.

National Semiconductor's Wireless Communications Group plans

to ship in March more lightweight components with a longer battery life for devices such as laptop computers, pagers, wireless telephone switches and cellular telephones. Weight and battery life are key concerns for the growing number of nomadic users wishing to minimize the weight they lug around while on the road.

National Semiconductor's PLLatinum line — the first fruits of the 2-year-old start-up group — integrates RF, digital and analog functions on one 3V integrated circuit. Most of the wireless products on the market in the U.S. today are still based on the more draining, 5V power consumption scheme, though many in competing nations such as Japan have brought the technology down to the 3V mechanism, according to VLSI Research, Inc., a market research firm in San Jose, Calif.

Inconvenience factor

The shorter battery life forces mobile users to carry battery chargers with them "that can weigh as much as their laptop computers," said G. Dan Hutcheson, VLSI Research's president. Because of the inconvenience this causes, "consumers have started buying products based on battery life," he said.

The vendor said the silicon products use 60% less power and represent a 51% smaller package size.

On the down side, National Semiconductor's components attempt to address a very broad RF range — up to 2.5 GHz for spanning

a variety of technologies. This approach could aggravate wireless devices' vulnerability to interference, said Andy Seybold, editor of "Outlook on Computing," an industry newsletter published in Boulder Creek, Calif.

"The more finely you tune the radio, the less susceptible it is to interference; the broader it is, the more susceptible it is," Seybold explained.

Integrating functions for more

First step
Users must choose wireless gear containing National Semiconductor's integrated components based on the type of network they intend to use, such as cellular, paging or packet data nets. Selection of a network service should precede the purchase of end-user equipment.

portable computing is a trend emerging from the likes of Motorola, Inc., Analog Devices, Inc., AT&T and NEC Corp., although none of these companies addresses the RF market yet.

In addition, the National Semiconductor chip is "cheaper because you get away from using gallium arsenide, which is like the difference between using diamonds and glass"

from a cost perspective, Hutcheson said. He estimated that PLLatinum could mean that the wireless components for the RF section of a device could run \$100 less than today's multichip 5V parts.

"Those are pretty significant savings" that will ultimately be passed down to the end user, he said.

For example, a European manufacturer of wireless voice/data systems that has struck a deal with National Semiconductor for PLLatinum has reduced its part count by 60%, said Curtis Schmidek, a member of National Semiconductor's wireless product marketing group. Schmidek estimated that RF components account for about one-sixth the cost of a wireless device.

National Semiconductor said it has also cut deals with vendors whose products conform to the Mobitex wireless packet data standard, as well as cellular phone and high-frequency cordless phone makers. These vendors are expected to make their own availability announcements in the coming weeks, according to National Semiconductor.

Hands on

Procrastinators can beat the clock with Guide Line

By Michael Fitzgerald
CUPERTINO, CALIF.

Symantec Corp. promises its new project manager, Guide Line, will have you scheduling projects within 10 minutes of installation.

Because it usually takes me 10 minutes to clear a space on my desk where I might plan a project, I decided to prove how outlandish this claim was. I was wrong; it did what it said it would.

I started planning in Guide Line for Windows 30 seconds after getting it installed, and I am now certain my Mardi Gras party will be far better than it otherwise would have been. (Of course, there is now a lot more to do than I thought.)

Symantec built Guide Line with 16 guides for easy project scheduling, ranging from frivolous tasks such as parties to serious ones such as local-area network administration and small business

start-up. Each guide creates a project outline and schedule by presenting choices on-line. The finished project can then be printed out, provided Time Line for Windows, Time Line 5.0 or Microsoft Corp.'s Project for Windows is already on the system.

Users who want increased flexibility can purchase Guide Line Maker. Guide Line Maker is an authoring system built around the Guide Programming Language, a scripting language.

Both Guide Line and Guide Line Maker run in DOS or Microsoft's Windows, and a version of Guide Line supports Project for Windows. Guide Line supports several project management products from Symantec, including Time Line 5.0 for DOS, Time Line for Windows and On Target 1.0. It imports files from all these programs, as well as Project for Windows.

Guide Line is priced at \$149.95. Guide Line Maker costs \$499; Guide Line for Project for Windows costs \$299.

Utilities

Mastersoft, Inc. has released Word for Word-Windows Edition, a document conversion utility.

The product is a Microsoft Corp. Windows-based application that supports document conversion between more than 100 PC formats and Apple Computer, Inc. Macintosh word processing, mail merge, spreadsheet and data formats, the company reported. A formatted document can be previewed before conversion with a file viewer.

The product costs \$149.

► **Mastersoft**
Suite A-320
6991 E. Camelback Road
Scottsdale, Ariz. 85251
(602) 277-0900

Macintosh products

Attain Corp. has introduced Version 2.0 of In Control, a to-do list manager for the Apple Computer, Inc. Macintosh.

More than 50 new features have been added to this version. A set of time management capabilities are available, including automatic reminders; more flexible printing to generate reports, outlines and lists in a variety of formats; and scripts to automate common time management activities.

In Control 2.0 costs \$129.95.

► **Attain**
48 Grove St.
Somerville, Mass. 02144
(617) 776-1110

Eastman Kodak Co. has announced Version 1.0 of Kodak PhotoEdge for the Ap-

ple Computer, Inc. Macintosh.

The software enables Macintosh users to quickly and easily produce basic image enhancement and correction of Photo-CD images and digital images in various formats.

Finished images can be copied, printed or exported.

PhotoEdge was designed to be used with desktop publishing, word processing and presentation packages. It supports a number of formats, including Tag Image File Format.

The product costs \$139.

► **Eastman Kodak**
343 State St.
Rochester, N.Y. 14650
(716) 724-4000

Software application packages

POC-IT Management Services, Inc. has introduced MicroMan Esti-Mate Express.

The product is a restricted function version of MicroMan Esti-Mate, the vendor's PC-based estimating and planning tool. MicroMan Esti-Mate Express was designed to determine the estimated hours needed for project events.

Model templates are used to make project plans, the company said.

MicroMan Esti-Mate offers additional features that allow users to create and modify original project templates and to adapt estimating algorithms to their environment with a self-adjusting "expert" feedback mechanism.

MicroMan Esti-Mate Express costs \$2,000; MicroMan Esti-Mate costs \$5,000.

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Workgroup Computing

Technical markets still Unix stronghold

By Maryfran Johnson

A favorite topic with Unix workstation vendors these days is how briskly sales are going in commercial business accounts.

Alas, the cold, hard research numbers tell a less enthusiastic tale.

Traditional technical markets remain the stronghold for Unix workstations and will continue to do so for years to come, according to a recent study by International Data Corp. (IDC) in Framingham, Mass.

IDC figures show 77% of workstation sales tied to applications such as software engineering, me-

Unix, page 42

By a large margin			
WordPerfect outsold all other third-party software providers on six* selected Unix workstations in 1991			
RANK	VENDOR/ APPLICATION	TYPE	LICENSES SOLD
1	WordPerfect Corp./ WordPerfect	Word processing	95,000
2	Applix, Inc./ Alis, Asterix	Office automation	23,200
3	Oracle Corp./ Oracle	Database management	15,000
4	Interleaf, Inc./ WPS	Technical publishing	14,600
5	Structural Dynamics Research Corp./I-Deas	Mechanical engineering	14,400
6	Island Graphics Corp./ Write, Paint and Draw	Graphics/ Word processing	14,000
7	Frame Technology Corp./Framemaker	Document publishing	13,830
8	Wolfspan Research, Inc./Mathematica	Numerical computation	13,800

*Sun, HP, DEC, IBM, Silicon Graphics, Inc. and Intergraph Corp.

Source: International Data Corp.

Groupware

Notes for Mac, Unix nears

By Michael Vizard
CAMBRIDGE, MASS.

Following the planned arrival of Version 3.0 of Notes next month, information systems directors can expect to see Lotus Development Corp. begin to make an all-out push to extend the number of platforms and network protocols supported by Notes.

Lotus' Notes has already sold close to a half-million licenses, but one of the factors limiting even wider acceptance of the groupware is that the software is available only on OS/2 servers.

In the hope of broadening its Notes base, Lotus will put in place during the next several months support for Macintosh clients, Unix clients and servers and a broad array of networking protocols.

The prime mover for expanding the Notes base will be the arrival of Notes Version 3.0, which, according to sources, should be announced on Feb. 24. That date, however, may slide to March 5, depending on trade show conflicts, they said.

Version 3.0 will provide support for a Macintosh client in addition to text-retrieval services, work-flow software and imaging software.

Shortly after the release of Notes 3.0, Lotus will make available support for Unix clients and servers under Notes, said Cliff Conneighton, Lotus' director of marketing for communications products.

"If Notes was up on Unix today, we would buy 500 to 600 copies," said Greg Buchanan, director of technology planning and development at

Cincinnati Bell Information Systems, Inc. in Maitland, Fla. "Our immediate interest is having support for a Unix client, but we'd also deploy Notes on Unix servers alongside our OS/2 servers."

Lotus is also working on a Notes port to Microsoft Corp.'s Windows NT, and for the past nine months has been working with Novell, Inc. to make Notes a NetWare Loadable Module (NLM).

"At the time of the announcement last April, we said we would have an NLM for Notes in about 15 months. We expect to hit that schedule," Conneighton said. That would place the arrival of a Notes NLM in the next six months.

He said Lotus' ability to bring Notes to NetWare users is tied to the delivery of NetWare 4.0, which is due at the end of this quarter, and the arrival of Notes 3.0, now in beta testing.

"Having Notes available as an NLM is very attractive to us," said Dahrien Rao, senior manager at Price Waterhouse. "Right now we have to have a separate OS/2 server for Notes. It would be better to be able to put Notes on the same server as other applications."

To link the disparate clients and servers that will be covered under the Notes architecture, Lotus said it intends to deliver native IPX/SPX support for Novell's NetWare in March, with support for Apple Computer, Inc.'s AppleTalk, Transmission Control Protocol/Internet Protocol and Digital Equipment Corp.'s Pathworks implementation of LAN Manager from Microsoft to follow.

Novell users cool to Windows for Workgroups

By Michele Dostert
BOSTON

■ Although Microsoft Corp. has marketed Windows for Workgroups as the ideal client for corporate local-area networks, attendees at the recent Network '93 said Novell, Inc. NetWare users are reluctant to install it on their desktops, for both technical and political reasons.

"I don't think Windows for Workgroups is selling nearly as well as Microsoft had expected, and I think the NetWare compatibility is a major reason why," said Michael Howard, president of Infonetix Research Corp. in San Jose, Calif.

Forrester Research, Inc. in Cambridge, Mass., surveyed 50 Fortune 1,000 users in December; it found only 16% of them firmly planning to buy Windows for Workgroups—and most of them planning installation at small, remote sites.

At the top of NetWare users' list of complaints is Windows for Workgroups' use of the Microsoft-supported Network Device Independent Specification (NDIS) standard, instead of the Novell-supported Open DataLink Interface (ODI) standard, to configure multiprotocol network interface cards.

"I was pretty disappointed when I started to install it and found that I would have to use NDIS and NDIS syntax instead of the ODI we have. In fact, I gave up in disgust," said Tabi Freedman, network manager at a large nationwide securities firm.

No major rollout yet

Freedman said that although she may use Windows for Workgroups to provide networking to small, remote offices with two or three unconnected PCs, she is holding off on a major Windows for Workgroups rollout until she can run the product over the same IPX/SPX-over-ODI transport used by her Novell LANs.

Another complaint was that the Microsoft NetBEUI protocol used

by Windows for Workgroups cannot cross Novell-compliant routers to reach Windows for Workgroups users on other LAN segments.

"Since most companies now segment their LANs at 20 users, this limits Windows for Workgroups' usefulness to within a small group," said Rick Nyhan, president of General Networks, Inc., a large Los Angeles-based reseller of both Novell and Microsoft products. Nyhan said he thought users would be confused by being able to reach the corporate network via NetWare but not via Windows for Workgroups.

Windows, page 40

Peer-to-peer pluses

Early adopters of Windows for Workgroups are uniformly enthusiastic about the peer-to-peer networking included in the product.

Bob Willier, a facilities manager at Dairy Queen in St. Louis, had a typical installation. He connected his Windows for Workgroups-based PCs and installed his electronic mail in about an hour, start to finish.

Willier said the hardest part of the installation was putting in network cards and pulling cable. "When I turned on the PCs, Windows for Workgroups autodiscovered the network card, installed the driver and then autodiscovered the other PCs," he said.

Dan Larner, a senior research analyst at Allen-Bradley Co., a Milwaukee-based maker of industrial control products, said, "A gorilla could set this stuff up. I think it's the perfect solution for small groups."

—Michele Dostert

Novell users cool to Windows client

CONTINUED FROM PAGE 39

Some Windows for Workgroups users also report problems with MS-IPX, the Microsoft version of Novell's IPX/SPX that the Windows product uses to access Novell servers.

Although Microsoft says MS-IPX packets are identical to those generated by

IPX/SPX, Novell said it has identified several problems with MS-IPX. According to William Donahoo, Novell's desktop products division manager, these include problems with print backup and device drivers.

NetWare users also said they are reluc-

tant to invest in a product that Novell has so far declined to support.

"Microsoft didn't consult with us when they built the NetWare connectivity into Windows for Workgroups, and the way they did it, Novell doesn't feel that it can support Windows for Workgroups in the way that our customers need," Donahoo said.

He added that although Microsoft did not submit Windows for Workgroups to the Novell-sponsored Technical Support

Alliance for testing, Novell wants to support that Windows environment and is working with Microsoft engineers to resolve problems.

Russell Siegelman, Microsoft's former product manager for Windows for Workgroups who is now assigned to a special project, said his company is open to suggestions.

"We had a team of engineers at Novell for a week on the NDIS stuff. None of these problems are things that can't be resolved," he said.

"It would be a mistake for both companies if Microsoft and Novell force users to choose between Windows for Workgroups and NetWare," said Jamie Lewis, vice president of The Burton Group, a Salt Lake City LAN research firm. "They need to sit down and get these problems fixed — and quickly, before user frustration gets worse than it already is."

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Peer-to-peer minuses

As a management issue, many corporate NetWare shops refuse to allow the peer-to-peer camel inside their networking tent.

"One of the primary assets of client/server LANs is that administrators can control access to and storage of applications and data," said Patrick Carney, information systems director at Asea, Brown, Boveri in North Brunswick, N.J.

"I don't want somebody calling me because they had a file stored under Windows for Workgroups on Joe's laptop, and Joe took the laptop to Japan with him, and could I please get him the file," he said.

Carney said that while he wants to offer Windows for Workgroups applications to his users, he is concerned about their using the environment to circumvent IS-dictated security and management procedures.

Rich Tong, Microsoft's new product manager for Windows for Workgroups, said corporate managers concerned about manageability should disable the product's peer-to-peer networking during installation.

—Michele Dostert

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Technical markets Unix stronghold

CONTINUED FROM PAGE 39

chanical design and engineering, scientific research and electronic design automation.

"It's interesting to see that as the vendors continue to push in commercial marketplaces, the majority of workstation shipments are still in areas like

CAD/CAM [computer-aided design and manufacturing] and software engineering," said Nancy Battey, an IDC analyst in Mountain View, Calif. "The commercial segment does seem to be growing, however, to about 23% of the worldwide total in 1991" — up from 20% in 1990.

The IDC report compiled data on the primary applications running on Unix workstations in 1991, the most recent annual revenue data available. By market share rankings, the Top 6 Unix workstation vendors were Sun Microsystems, Inc. (34%), Hewlett-Packard Co. (18%), Digital Equipment Corp. (13%), IBM (8%), Intergraph Corp. (7%) and Silicon Graphics, Inc. (6.5%).

In the blizzard of numbers generated by the report, a few surprises emerged,

such as the following:

- IBM remained the only vendor among the Top 6 that failed to place first in any of the 17 application segments that IDC evaluated. "IBM really needs to get out there and own some application segments," Battey noted. "All our data points to the fact that applications are what drive workstation sales."

- Silicon Graphics broke out of its high-end graphics niche and began competing in broader segments such as mechanical design. Silicon Graphics "is giving HP a real run for its money in that area," Battey said. The company ranked first in three segments — biological/chemical engineering, simulation and animation — but from 1990 to 1991 lost its No. 1 position in industrial process analysis to HP, and in imaging to DEC.

- DEC lost its No. 1 position in scientific research/research and development to HP in 1991, but picked up the No. 1 position in both imaging and measurement and control. However, imaging represented only 1% of the market, and measurement and control is the smallest segment, with 0.5% market share.

Overall, Sun, HP and DEC represented nearly two-thirds (65%) of total revenue and 70% of total shipments in the worldwide workstation market.

The second-tier workstation vendors — IBM, Intergraph and Silicon Graphics — brought in 22% of worldwide revenue for 1991 but had only 12% market share of shipments.

The business/professional portion of the Unix application market grew 32% in 1991 — a bigletdown from its 61% growth in 1990. Over the next few years, Battey said, Unix companies such as Sun and HP are unlikely to see more than 30% of their workstation sales going into business, rather than technical, accounts.

"The vendors are making great strides in commercial accounts, in going from zero business to about 20% of their sales," Battey pointed out. "But it's not like we're seeing workstations taking over the commercial segment from PCs."

The wild card that has yet to be played is Microsoft Corp.'s NT 32-bit advanced operating system. DEC and Intergraph have committed to running NT on their platforms, but no other major workstation vendor has broached the issue yet.

The four fastest growing application segments worldwide were industrial process analysis, "other" commercial (including office applications), classified defense and biological/chemical engineering.

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Enterprise Networking

Hints

Recovering from hacker invasion

By Mitch Betts
WASHINGTON, D.C.

Your interstate computer network has been cracked, hacked and attacked. What do you do next? How do you prosecute?

The world of criminal investigations and prosecutions is foreign territory for most information systems managers — and what little they do know may be wrong, according to James L. Kolouch, a special agent at the Federal Bureau of Investigation who specializes in investigating computer crimes.

At the January meeting of the local chapter of the Information Systems Security Association, Kolouch described a multitude of misconceptions that IS managers have about the law and investigations.

For example, many IS managers believe the key statute, the Computer Fraud and Abuse Act of 1986, applies only to federal government computers, which is not true. It also covers interstate crimes involving private-sector computers.

Hack-attack response

What to do if victimized by a hacker:

- Promptly notify your network security officer and law-enforcement authorities.
- Select one authoritative person, such as the IS manager, who will be the main point of contact and the person called to testify.
- Start keeping records, collecting and securing evidence and compiling cost information.
- Plan what you will say and do if the intruder contacts you.
- Provide technical assistance to investigators.
- Do NOT "clean up the system" (which destroys evidence) or discuss the case over unsecured electronic mail.

Source: Federal Bureau of Investigation

Presented here, in question-and-answer format, is a summary of the key points Kolouch made in his remarks.

Q: What is the current law covering computer crimes?

A: The federal Computer Fraud and Abuse Act of 1986 covers crimes involving a "federal interest computer," which is defined as a computer used by the federal government (including government contractors); a federally regulated financial institution; or any private-sector computers in more than one state. The law also gives special protection to medical records.

The act has many provisions, but the two most useful to prosecutors are the following:

- Section (a)(4), which covers access to a federal interest computer with intent to defraud.

Recovering, page 45

'Smarter' LAN tools debut

By Elisabeth Horwitt
BOSTON

■ Network General Corp. and Novell, Inc. unwrapped local-area network diagnostic tools featuring greater intelligence at the recent Networld '93 conference. The vendors said they will eventually offer the ability to diagnose multiple LANs from a central, Simple Network Management Protocol (SNMP)-based system.

In an increasingly competitive arena, tools to help less technical — and less highly paid — users perform network diagnostics are at a premium. Previously, rivals Hewlett-Packard Co. and Network General jointly announced a certification program that tests network administrators' knowledge and hands-on expertise in protocol analysis.

The LAN analysis market grew from \$111.1 million in 1991 to an estimated \$172.2 million in 1992, with Network General maintaining dominance and Novell and HP in the No. 2 and No. 3 slots, respectively, according to Dataquest, Inc., a San Jose, Calif., research firm.

Network General President Harry Saal

promised to extend expert system capabilities beyond the company's original, stand-alone Sniffer offering to two additional products. The Distributed Sniffer, which collects diagnostic data from multiple LAN servers, will get the capability later this quarter. Sniffer Internetwork Analyzer, which troubleshoots LAN-to-LAN connections, will get its expert system at a later, undisclosed date.

Novell also said it was providing expert system capabilities for LANalyzer for NetWare, its low-end analyzer that troubleshoots NetWare LANs. A NetWare Loadable Module (NLM) priced at \$1,495, the product will also be the first LAN diagnostic tool with a Windows 2.0 interface, Novell said. Novell has renamed it LANalyzer for Windows.

The term "expert system" in a LAN analyzer can mean anything from a sophisticated rules-based system that analyzes the source of a problem, runs a series of diagnostics and tries to correct it, to a series of help desk templates that automatically call up the likely source of a problem when the user clicks on an icon.

NetWare Expert, Novell's expert system for its LAN diagnostic tools, suggests the best

Smarter tools, page 44



Price guide

LANalyzer for NetWare: Price, \$1,495; about 5,000 units installed.

Network General Sniffer: Priced starting at \$12,000, roughly 10,000 installed.

LAN analyzer market:
1991: \$111.1 million, or 68.8% more than 1990;
1992: Estimated \$172.2 million (roughly 55% growth over 1991).

Novell repositions messaging server

By Lynda Radosevich

At Networld '93 Boston, Novell, Inc. relaunched its NetWare Global Messaging server, giving the product a new name, some updated features and a publicity drive to position it as a player in the corporate messaging market.

Now called NetWare Global MHS, it is a set of messaging modules that can be loaded in the Novell NetWare operating system.

Novell said the name change is intended to highlight Message Handling Service (MHS), the mail transport technology that Novell licenses from Action Technology, Inc. in Alameda, Calif.

NetWare Global Messaging now includes FirstMail, a simple electronic-mail utility for DOS and Apple Computer, Inc. Macintosh computers, and a server support feature that lets one MHS server collect and route messages for users based at other servers. Additional modem support includes Telebit Corp.'s T1000 and Intel Corp.'s 2400 EX. Asynchronous message transferring has been improved so the messages can travel more efficiently over lines in both directions at once. A new mail notification feature enables users to read messages without leaving the application.

Novell is also shipping MHS gateways to Simple Mail Transport Protocol (SMTP), the mail

transport for Transmission Control Protocol/Internet Protocol networks, and IBM's Systems Network Architecture Distribution Services (SNADS). Novell is developing an MHS-to-X.400 gateway with Retix, which Novell said will ship in the first quarter.

For companies such as PMI Food Equipment Group, a commercial and retail food equipment manufacturer in Troy, Ohio, MHS is vital for linking disparate E-mail systems. PMI has roughly 250 PC users running Futurus Team Mail on a NetWare LAN.

The E-mail users can connect to nearly 1,000 IBM mainframe users running Fisher International Systems Corp.'s EMC 2 through Fisher's MHS gateway. The PMI mail system also connects about a dozen Macintosh users running Pegasus Mail with an MHS gateway.

"We built our local-area network and electronic-mail systems as a grass roots effort starting in engineering," said Jeff Lyons, a design systems engineer at PMI's weigh/wrap engineering division. "Once people on the mainframe saw what engineering could do with E-mail, they wanted it too, and we had to expand. MHS let us do that."

PMI plans to migrate to the updated NetWare Global MHS and deploy the SMTP and SNADS gateways to take advantage of new directory synchronization features across the gateways, according to Lyons.

Native form

As part of the overall push to highlight MHS at Networld '93, Keyword Technologies Ltd. announced Keypak NLM, an E-mail package that lets NetWare Global MHS users send and receive word processor documents in their native format.

The software automatically translates attached files from WordPerfect Corp.'s WordPerfect, Microsoft Corp.'s Word, IBM's DCA/RFT and Digital Equipment Corp.'s DX formats, according to Keyword. This lets users work with attached electronic files when they do not have the original application. It is slated to ship by the end of the month.

'Smarter' LAN tools debut

CONTINUED FROM PAGE 43

course for resolving a problem and also has an eight-hour training course that takes users through the basics of network analysis, Novell said.

However, "Novell really doesn't have an artificial intelligence front end," said Gary Whippick, a communications analyst at Union Bank of Switzerland who uses both LANalyzer and Sniffer. "What it has are templates of tests that it thinks you should run" when a problem surfaces, he said. "It doesn't interpret results" as Sniffer does.

Sniffer's more sophisticated expert system "automatically goes out and checks when something goes wrong," and it determines the most likely reason for "certain error conditions," Whippick said. On the other hand, Sniffer's expert

system only handles a limited number of trouble scenarios, while Novell's LANalyzer provides test suites for a wider range of problems, he added.

LANalyzer for Windows has also gained the ability to analyze Transmission Control Protocol/Internet Protocol

and Token Ring LANs. It also generates alerts that notify the user of IPX or Apple Computer, Inc. AppleTalk router failures, Novell said. Version 1.0 only supported Ethernet LANs.

All in one

Wal-Mart Stores, Inc. special project manager Mike Fitzgerald said that he wanted to see a Sniffer that would automatically bring up on one console "the big picture" of what is happening across

enterprise LAN installations.

A Windows-based version of Distributed Sniffer, due to ship later this year, will enable the network manager to monitor multiple remote LANs in multiple windows on the screen, according to Network General's Saal.

However, this is not the same as having software automatically monitor multiple LANs simultaneously and present consolidated information as graphics on a screen, he conceded.

New kid in town

A relative newcomer to the protocol analyzer scene, Dolphin Systems introduced ESP Plus at Networld '93. ESP Plus has a "full-blown expert system that advises users on timing problems and packet errors," and it runs on a 486DX/50-MHz Extended Industry Standard Architecture PC, a spokesman for the Norcross, Ga., firm said.

ESP Plus can write incoming protocol analysis data directly to a 540M-byte hard disk. Other protocol analyzers that write to random-access memory have limited room for writing real-time network traffic statistics, the spokesman added.

ESP Plus also supports two network cards and can handle diagnostic information coming in from two separate Ethernet or Token Ring LANs, the spokesman said. However, the system can only process information from one 100M bit/sec. Fiber Distributed Data Interface (FDDI) network at a time.

The product is base-priced at \$20,000, which includes two network cards. An FDDI card is an additional \$5,000 for a single-attached station and \$7,500 for a dual-attached station.

— Elisabeth Horwitt

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Recovering from hacker invasion

CONTINUED FROM PAGE 43

• Section (a)(5), which covers unauthorized access to a federal interest computer that damages, alters or destroys data (or prevents regular use) and causes losses exceeding \$1,000.

Both the FBI and the U.S. Secret Service have jurisdiction to investigate cases

under this law.

Q: What is the role of the Secret Service?

A: Under a "memorandum of understanding" between the [Secret Service and the FBI], the Secret Service tends to

handle cases involving credit bureaus, credit cards, automated teller machines, telephone fraud and U.S. Department of Treasury computers.

Q: What is the role of the FBI?

A: The FBI tends to handle cases involving espionage, classified data, government-related fraud, terrorism, bank fraud, wire fraud and organized crime.

The FBI only does investigations, not prosecutions. In essence, it must collect

enough evidence to "sell" an assistant U.S. attorney on the idea of prosecuting the case, and that can be a tough sell.

FBI agents are spread thin, so they must be selective about the cases they take on. When you call your local FBI agent, the agent will try to get answers to the following questions:

- Is this a violation of a federal statute?
- Is this related to another pending case or one being handled by another agency?
- Is this case significant enough to interest the U.S. attorney general?
- Has the victim done something — such as "cleaned up the system" or waited too long — that jeopardizes the investigation or prosecution?

Q: What exactly can the FBI do?

A: If the FBI opens an investigation of the case, it has a variety of tools at its disposal, including court-ordered wiretaps and searches, grand jury subpoenas, hidden cameras, informants, polygraphs and foreign police contacts.

The FBI will *not* "take control" of a company's computer system, as many companies fear. Rather, it will ask the system operator to provide technical assistance.

Many companies ask the FBI to interview a suspect for the purpose of "scaring the daylights" out of the hacker, but the FBI is not allowed to do that.

Be forewarned that investigations are slow. They often take a year or two, and you will *not* get briefings on their progress.

Q: What is the best evidence?

A: Audit trails and unaltered copies of the computer database as it appeared before, during and after the incident. Carefully label, initial and seal the evidence and limit the number of people handling it, to ensure that it is not corrupted.

Q: Are "warning screens" required for convictions?

A: No, but they are helpful because they show that the hacker "knowingly" intruded.

Likewise, "welcome screens" do not preclude prosecution but are discouraged because the defense might attempt to emphasize the literal definition of "welcome."

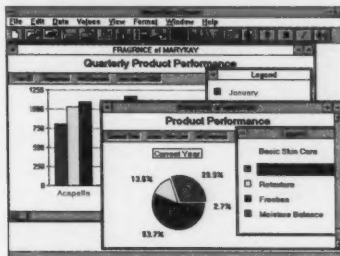
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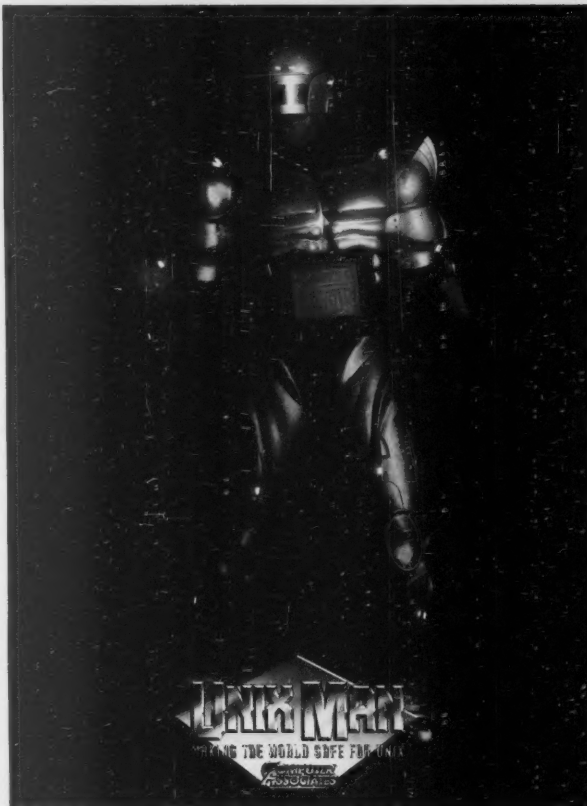
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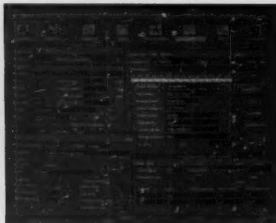
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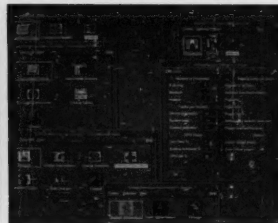
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Client/server strategies pervasive

By Rosemary Cafasso

Client/server obstacles

When asked where they see resistance, users who are planning client/server systems listed the following reasons:

- Don't understand what it can do.
- Cost of investment.
- File/Data integrity issues.
- Security issues.
- Cultural change is a problem.
- IS organization.

For those not planning such projects, "cost of investment" and "security issues" were the most common roadblocks.

Users already running client/server systems cited lack of understanding, cost, the IS organization and cultural change as obstacles.

It is hard to find an information systems manager these days who is not interested in client/server computing or who says he will not be interested very soon.

Two recent surveys drive that point home. A report from International Data Corp. (IDC) and a soon-to-be-released survey from Sierra/Alliance, Inc. track the rising importance of client/server technologies in IS managers' plans.

The IDC report, based on interviews with 243 IS managers with commitments to client/server computing, shows that even among those sites that plan only a gradual shift to this architecture, the goal is effectively to double the number of current client/server applications by 1995.

Client/server worldwide

The managers in the IDC study were part of a larger survey in which approximately 1,000 of 6,600 worldwide respondents had either implemented client/server applications or planned to do so.

Of the 100 IS managers interviewed for the Sierra report, 80% either were currently involved in client/server projects or said they will eventually move to this architecture.

Both market research firms reported that many of the IS managers who have implement-

ed client/server technology were reporting productivity boosts but were not yet seeing significant cost savings. In fact, the IDC study said that more than half of IS managers were reporting the new client/server applications as "net

owns Sierra/Alliance. "But IS managers are willing to pay more now instead of paying later."

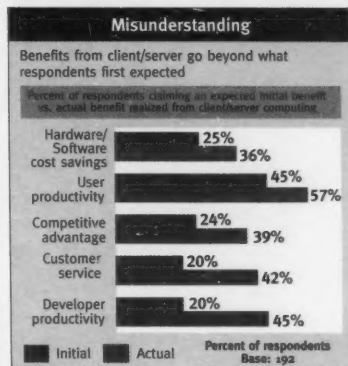
The IDC report, completed in December 1992, said many users reported bigger benefits than originally expected in such areas as improved user productivity. Anthony Picardi, IDC's director of software research, said some respondents may have toned down initial expectations if they were uncertain of what the actual results would be.

Cost savings delayed

People expecting client/server to save money will be disappointed, as that is not going to happen immediately, Picardi said. "With the cost issue aside, the question is, were the business objectives reached? Their answer here is yes. In other words, client/server is working as a software architecture."

Picardi said the survey showed several benefits to users, including better access to data, easier use of applications and overall productivity boosts. In addition, respondents said client/server applications have improved developers' productivity, which in turn translated to improved application quality and better customer service.

He also said respondents, on average, were allocating about 40% of their staff time to client/server projects.



Source: International Data Corp.

expenses," while 34% said the applications produced "net savings."

"Client/server is actually costing more right now," added Marty Gruhn, executive vice president of Alliance Development Corp., which

Storage

Optical disc yields far speedier storage system

By Thomas Hoffman
NEW YORK

■ A new optical disc-based image storage system for historical record keeping at the New York Clearing House Association is expected to save the organization more than \$100,000 annually in maintenance and microfiche upkeep.

Clearing House, founded in 1853 and supported by 11 New York banks, is the nation's largest bank clearinghouse. Initially formed to bring order to the exchange and settlement process among the banks of New York, Clearing House today is responsible for two primary applications.

Clearing House Interbank Payments System (Chips) is an on-line, real-time electronic payment system that transfers funds and settles international transactions for 122 banks in U.S. dollars. It handles \$1 trillion each day.

The second application, the New York Automated Clearing House (ACH), was launched in 1975 to act as a network for domestic consumer and commercial payments by 650 depository financial institutions in New York, northern New Jersey, Puerto Rico and the U.S. Virgin Islands. ACH is a batch-oriented system that handles

nearly \$170 billion—or 18 million transactions—each month for commercial banks, savings and loans, savings banks and credit unions.

Until recently, Clearing House downloaded Chips and ACH transactions from Unisys Corp. magnetic disks and an Eastman Kodak Co.



George Thomas expects a one-year payback time

Komstar microfiche system, respectively.

However, the microfiche system has been expensive to maintain and cannot conduct text searches as can the optical disc-based system, according to George F. Thomas, senior vice president and director of data processing at

Clearing House.

"We wanted multiple indexes for things like system sequence numbers," said Thomas, who noted that these tasks can now be performed using an image software system from Macro Soft in Beaconsfield, Quebec.

Clearing House wrote a program designed to download data from the magnetic disks on its Unisys A-15 mainframe systems to its Novell, Inc. local-area network environment. From there, the information is downloaded to 12-in. optical discs, which are housed in a Laser Magnetic Storage International, Inc. Rapid Changer jukebox.

Radical time difference

Speed is a key benefit from the new system. According to Thomas, daily Chips data can be downloaded in 2½ hours on optical discs. Using microfiche, that process took 14 hours.

Clearing House expects to save \$50,000 annually in microfiche maintenance for both the Chips and ACH systems and \$60,000 each year on microfiche costs alone, Thomas said. Clearing House began using the optical system for Chips in early January, with ACH targeted for February rollout.

Thomas would not discuss the cost of the new optical disc, page 49

ON SITE

New York Clearing House Association New York

Challenge: To replace a microfiche-based storage system with an optical disc image-based system for historical records on national and international banking payments processed without hurting uptime.

Technology: Macro Soft software, Laser Magnetic Storage International Rapid Changer jukebox, four Unisys A-15 mainframes.

Results: Annual savings of \$50,000 in microfiche maintenance, \$60,000 in microfiche costs.

Court sends message via CA ruling

By Thomas Hoffman
UNIONDALE, N.Y.

Though a recent decision by a federal appeals court on trade secrecy does not set any legal precedents, legal pundits said the ruling sends a strong message to the software industry to beware of trade secrecy protection.

On Dec. 18, the U.S. Court of Appeals for the Eastern District of New York reversed a circuit court decision made in June [CW, June 29, 1992] that restricted Computer Associates International, Inc. from stopping Altai, Inc.'s illegal use of trade secrets. The case has been in litigation since 1988, when CA filed a lawsuit against Altai for misappropriation of trade secrets and copyright infringement.

In 1988, CA filed the trade secret misappropriation/copyright infringement suit against Altai, claiming Altai had used CA's Adapter code in CA-Scheduler to design Altai's Oscar 3.4.

Altai then rewrote Oscar's source code. Although the court has continued to uphold its decision that Oscar 3.5 — the rewrite — did not violate copyright infringement against CA, the Dec. 18 reversal on the trade secrecy decision may pave the way for CA to seek a permanent injunction barring Altai from marketing any products that violate CA's trade secrecy rights.

Praise for decision

One legal observer said the court corrected itself. "I think the Second Circuit's reversal is a more correct take on the Copyright Act than its first decision," said Barry Rein, an attorney at Pennie & Edmonds in New York who has been following the case.

As a result of the court's reversal, CA may be entitled to compensatory damages, according to Michael McElroy, a vice president at CA. The appeals court sent the case back to the trial court, where CA said it will seek to have Altai permanently barred from further marketing Oscar 3.5 and to collect "several million dollars."

Several legal experts said the decision will force software vendors to be more wary of recruiting employees from competitors. "You can't ignore what information someone is taking with them from another job. It brought [Altai] more trouble than they ever bargained for," said Ronald Abramson, an independent attorney at Hughes Hubbard & Reed in New York.

"Companies are going to have to be careful in their hiring practices of competitive employees. Lawyers who advise those companies are going to have to read this case most closely," said David Binney, an attorney at Preston, Thorgrimson, Shidler, Gates, and Ellis, a Seattle law firm representing Microsoft Corp. in its "look-and-feel" case against Apple Computer, Inc.

Binney said vendors will be forced to

closely scrutinize the hiring of competitive employees and perhaps force them to sign waiver agreements that insulate the hiring vendor from trade secrets that may be passed on by the employee, even if the employee passes secrets along unknowingly. Binney added that user com-

panies should also be wary in their own hiring practices because unlawful intellectual property transfer could also affect them.

Abramson, who is also chairman of the Computer Law Committee of the Association of the Bar of the City of New York,

said the decision, while not precedent-setting, is still important because it reaffirms trade secrecy protection, especially if companies do not have a valid copyright protection claim.

However, he added that it would be a mistake for a software vendor to rely solely on trade secrecy protection. "A growing number of software firms are protecting themselves through the patent process, many of which are pursued secretly," Abramson added.

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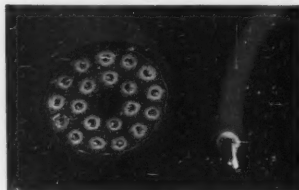
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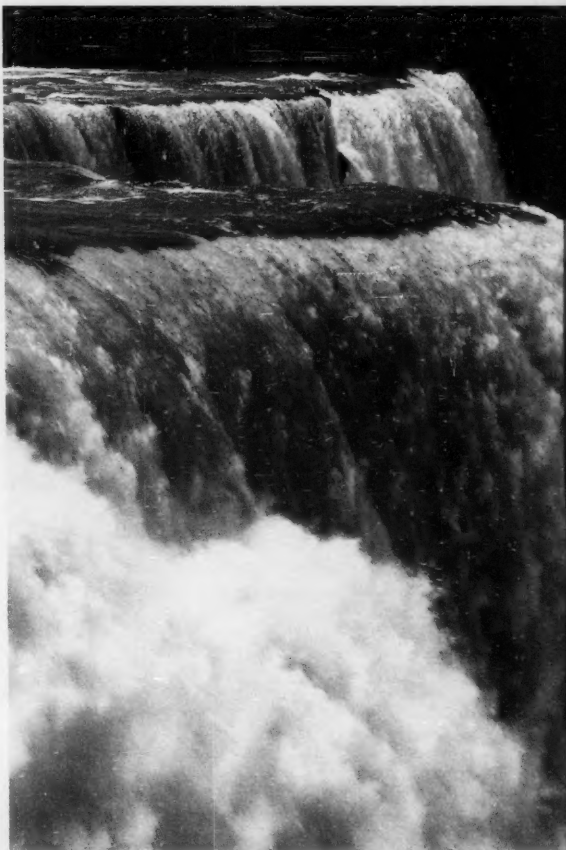
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Mitsubishi to leave mainframes behind

By David Kellar
TOKYO

Japan's Mitsubishi Electric Corp. has stopped development of mainframe computers and shifted its focus to networked client/server systems, according to officials at the manufacturer.

The decision affects Mitsubishi's Melcom EX800 series, the company's only remaining independently developed large-scale computer line, and reflects the general trend among users away from mainframes toward more cost-efficient client/server systems.

Mitsubishi will continue to produce

and sell the EX800 for now but said it plans eventually to phase out all mainframe production.

Mitsubishi's withdrawal from the mainframe arena actually began in 1991, when the firm started reselling IBM Enterprise System/9000 mainframes under its own brand name as the Melcom EX900

series. Officials said Mitsubishi will now direct new customers to either the IBM-made EX900 machines or the high-end servers in its PC line, which are supplied by Apricot, Mitsubishi's wholly owned UK-based affiliate.

In conjunction with the move, Mitsubishi plans to set up four new divisions by spring to concentrate on network development and system integration services. The firm will transfer an unspecified number of employees from its mainframe division to the new units.

Mitsubishi's virtual withdrawal from the mainframe market leaves only three Japanese mainframe makers — Hitachi, Inc., Fujitsu Ltd. and NEC Corp.

Kellar is a correspondent at the IDG News Service.

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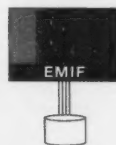
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Optical disc

CONTINUED FROM PAGE 47

system, but he estimated that it would pay for itself within one year.

In addition to the optical disc system, Clearing House is busy with other information systems projects. According to Thomas, Clearing House plans to install a Unisys Remote Database Backup (RDB) system designed to facilitate ACH data recovery between Unisys A-15 mainframes at the ACH primary data center in Weehawken, N.J., and the alternate ACH data center in New York.

Without the RDB, data recovery from one site to another usually takes up to one hour. With RDB, Thomas said he expects the data switch to be completed in 15 minutes.

Chips data recovery between New York and Weehawken is facilitated by an in-house software package running on Hyperchannel, a channel connection/mainframe interface from Network Systems Corp. in Minneapolis.

Gradual testing

Thomas said the remote database for ACH will be installed by year's end. Clearing House will begin testing the database by transferring check processing transactions from a Unisys Micro A computer used at a downtown facility by the end of the first quarter.

Clearing House is also working on a pilot aimed at significantly reducing the \$25 billion in combined check fraud its 11 member banks report each year. One system, called the Clearing House Electronic Check Clearing and Return System, will allow banks to send images of checks to one another, regardless of each bank's computing environment.

Thomas said an accompanying system, called Electronic Check Presentation (ECP), will provide banks with earlier notification of returned checks by using NCR Corp. 7710 low-speed scanners to read the microline attached to each check processed, thereby providing faster turnaround on check verification. This helps reduce check fraud, he said.

ECP, Thomas said, will also let member banks debit customer checking accounts one day faster than current methods.



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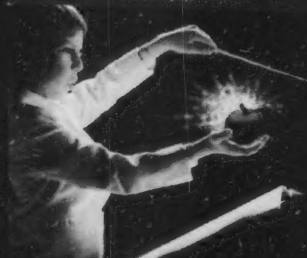
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C++ users lack cross-platform support

By Christopher Lindquist

C++ has been positioned as an ideal transitional language for developers looking to move to object-oriented programming. But while the number of C++ compilers has increased in recent years, they have yet to reach the level of platform and tool support that C programmers have come to expect.

"As much as I would love to use it, [C++] is out of the question," said Clark Maurer, president of Raleigh, N.C.-based MicroEdge, Inc. Maurer's company makes several development tools, including a programmer's editor called SlickEdit, that support as many as 14 computing platforms.

That wait may continue for several more years, according to other potential C++ users and analysts. Standards for C++ have yet to be fully implemented by the American National Standards Institute's (ANSI) C++ committee, and compilers today generally follow either the AT&T C++ standards or the preliminary ANSI standards, which are not always compatible. Nor is code, including third-party libraries, written for one compiler likely to work with others. And that is a problem for any company that has to support code on a variety of systems.

The C++ market "is very immature," said John R. Rymer, editor of "The Distributed Computing Monitor" at the Patricia Seybold Group

in Boston. "There are a lot of companies selling technology, but no one is selling a solution."

Coming up short

That situation is apparent to Cadence Design Systems, Inc., according to Rene Churchill, a senior member of the firm's technical staff in Lowell, Mass. Cadence supports a variety of Unix platforms and has been investigating C++ compilers hoping to find one that could be used across platforms.

The results so far have not been particularly encouraging. Adequate tools, particularly debuggers, are not plentiful for C++ compilers, Churchill said. And while most of the hardware companies Cadence works with supply C++ compilers for their systems, those compilers are not likely to be portable to a competitor's system.

There is one compiler that seems to meet most of the requirements: The GNU C++. Tools are available for it, and it is portable across a large number of platforms. Even better — it is free. But that very positive point results in the biggest negative for the GNU C++ compiler.

The GNU C++ compiler is another result of the Free Software Foundation's GNU Project. The compiler, complete with source code, is available on request from the foundation and can also be downloaded from many electronic bulletin boards. Because of the

C++ sampler		
A partial listing of available C++ compilers and the platforms they support		
COMPANY	PRODUCT	PLATFORM
Borland International, Inc.	Borland C++	MS-DOS, Windows 3.X
Symantec Corp.	Zortech C++	MS-DOS, Windows 3.X, OS/2 2.0, SCO Unix, Apple A/UX
Free Software Foundation	GNU C++	Portable to some 50 platforms, including Unix and MS-DOS. Source code included.
Liant Software Corp.	LPI-C++	AT&T Unix System V, Sun/OS
Microsoft Corp.	Microsoft C/C++ 7.0	DOS, Windows
Lucid, Inc.	Lucid C, C++	Sun OS
Metaware, Inc.	HighC/C++	MS-DOS, Sun/OS, SCO Unix, IBM 370/ESA

availability of source code and the fact that it is free, users have ported the GNU C++ to dozens of platforms, including DOS and many variations of Unix. It sounds good, but the drawbacks are considerable.

Lack of support

The Free Software Foundation will not support you. For that you will have to go to an outside support firm such as Cygnus Support in Mountain View, Calif. Cygnus President Michael Tiemann not only supports GNU C++, he wrote it.

"There are a lot of companies selling technology, but no one is selling a solution," said John R. Rymer, editor of "The Distributed Computing Monitor" at the Patricia Seybold Group.

According to Tiemann, Cygnus will provide customers with everything from simple maintenance releases to custom porting services for a fee that ranges from four to six figures per year.

There is another consideration when using GNU C++, however. Because GNU C++ is a product of the Free Software Foundation, it is covered by its "copyleft." The copyleft is a license that says users can use, modify and distribute GNU software provided it is done so free of charge and that source code is available upon request — something many software developers are loath to do.

There is a loophole for the compiler, however. Simply using the compiler to compile your code does not subject your code to the copyleft. The problem occurs if you use any GNU libraries, which is quite likely. Under those circumstances the foundation has an out for you: You simply must supply the libraries and their source code upon request and allow users to modify and relink those libraries at will. You need not supply all of your source code.

Tiemann admitted that even the loophole is not enough to assuage some potential customers. "A lot of people are not comfortable with the GNU Library License," he said.

So for now, C++ may be an option only if you are doing development for a specific platform and have no need to port it soon.

User groups form to pressure object-oriented software vendors

By Garry Ray

■ Commercial users of object-oriented technology have decided that vendors do not understand their problems. Now they are out to set things straight.

In the last year, two user groups representing hundreds of corporate technologists have been formed to influence object-oriented software vendors and industry associations such as the Object Management Group (OMG).

The two organizations — the Forum for Distributed Object Computing (FDOC) and the roughly 250-member Corporate Facilitators of Object-Oriented Technology (CFOOT) — share a similar mandate despite differences in orga-

nization. While both groups focus on the business implementation of object-oriented technology, CFOOT functions primarily as an information-sharing group. FDOC, a smaller group of high-powered information systems managers, wants to influence object-oriented vendors and standards bodies.

Driving both groups is the conviction that "vendors have been focused on the technology, not on the corporate issues," said Bob Marcus, the founder of CFOOT and coordinator of object-oriented technology at Boeing Computer Services in Seattle.

Marcus independently started CFOOT as a vehicle to bring a wide range of corporate technologists together over the Internet electronic-mail network. He is also an original member of

FDOC, which has had a slower start because of administrative and legal concerns.

However, Marcus said he thinks both groups can influence the direction of the technology. "If we can work on technology and business issues and bring pressure upon the vendors, there can be a real breakthrough" in object-oriented systems, he said.

Other CFOOT participants value the group as a forum for discussion but do not think it will have much influence on object-oriented vendors. "I have a stronger lever with vendors as the representative of a large company," said Bruce Bohannon, a scientist at Hughes Information Technology Co. in Denver.

FDOC, the smaller but potentially more potent user organization, was formed last year by IS managers from about 30 companies including American Airlines, DHL Airways, Inc., Electronic Data Systems Corp. and Citibank NA. Although the group remains temporarily stalled due to administrative issues, members said they hope to have a notable presence with ven-

User groups, page 56

How to reach them

Corporate Facilitators of Object-Oriented Technology can be reached by E-mail at marcus@boeing.atc.com.

The Forum for Distributed Object Computing, currently undergoing a more formal organization, will convene at the Patricia Seybold Distributed Object Computing Technology Forum scheduled to be held in Boston in April.



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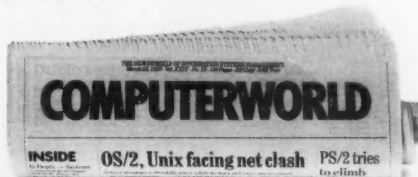
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The Newspaper of IS

Paul Winsberg

Has IBM scored?

Late last summer, IBM downsized Repository Manager and AD/Cycle, its mainframe CASE strategy. According to most reports, Repository Manager development is now frozen; instead, IBM is hard at work on a LAN strategy called AD Platform. This approach is of great significance for IBM and the CASE market.

AD Platform is an internal name only; the official name may be different. Unlike AD/Cycle, it is oriented to LAN-based, client/server computing and the public

standards inherent in open systems.

Here are the key components of AD Platform:

■ **Operating system independence.** Initially, AD Platform will run on AIX and OS/2; tools and users of AD Platform will be unaware of the underlying operating system.

■ **Object-oriented database.** The repository runs on the Versant Object Technology Corp. object database system; however, it was designed to port to other

object databases with minimal changes.

■ **Tool services.** The repository consists of C++ code layered on top of Versant. This code implements CASE utilities, such as time and resource tracking, task management, distribution of data and processing and parallel development. These utilities are the crucial interface between CASE tools and the repository; CASE tool builders at IBM and other vendors must write for these utilities to plug into the repository.

■ **User interface services.** IBM will provide a set of classes and associated methods to support Common User Access (CUA) and Motif. It should be

straightforward to extend the library to Windows or OpenLook in the future.

■ **IBM and third-party tools.** Although IBM has made no announcements on this subject, the smart money says most of the AD/Cycle case tools eventually will be available in AD Platform. This includes products such as the CMVC/6000 configuration management tool, Workstation Interactive Test Tool, Bachman, KnowledgeWare and other independent software vendor tools. Lower CASE products such as Cross System Product may take longer to arrive in AD Platform because they are more difficult than upper CASE tools to port to AIX and OS/2.

■ **IBM Information Model.** The Information Model is the only important tangible product of the ill-conceived AD/Cycle debacle; along with Portable Common Tools Environment (PCTE), it is the key CASE standard today. It is proprietary to IBM, but it is now before ANSI and European Computers Manufacturers Association committees and is in any case becoming a de facto industry standard.

The Information Model will be adopted in AD Platform. Currently, the Information Model supports the high-level business model and the low-level technology model but does not cover the critical mid-level design model.

There are many good things about this new strategy. It emphasizes immediate software development needs, such as configuration management, and defers lower priority goals such as enterprise data modeling. It incorporates the right standards (Unix, PCTE, CUA, IBM Information Model).

The LAN and workstation orientation offers superior price/performance to mainframes for computationally intensive applications.

The list of Repository Manager flaws is lengthy and well-documented; it is enough to say that Repository Manager was a bad solution (severe technical flaws) to the wrong problem (mainframe CASE, based on proprietary standards). It seems that AD Platform solves the right problem with sound technology and a rational architecture.

Has IBM finally got it right?



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User groups form

CONTINUED FROM PAGE 51

dors and industry standards groups.

Part of that influence will be needed to nudge reluctant software vendors to invest in new technologies and platforms. Because the demand for object-oriented wares is small and experimental, vendors seem unwilling or unable to make

the investments needed to address the problems of large corporate installations, members of both groups said.

"We were seeing slow motion on the part of the vendors to address our needs," said Meg Lewis, a managing director at the Sabre Computer Services division of American Airlines in Fort Worth, Texas. "They're trying to balance their [technology] investment portfolio, just the way we are."

Although uncertain that FDOC can di-

rectly address the economics issue, Lewis speculated that consortium development—a potential direction for the organization—could provide the financial incentive for vendors to move more quickly. "There might be a way for the developer and 15 companies to fund development. Everybody wins," she said.

FDOC and other user organizations also provide the one element software vendors and standards organizations cannot replicate: real-world experience.

"No one is looking at the end-to-end issues of the technology, from the user interface to databases," said CFOOT member Rao Mikkilineni, director of advanced software technology at US West Advanced Technology in Boulder, Colo.

Mikkilineni said vendors and standards groups are carving out small areas of technology expertise but are ignoring the more complex and difficult issues of systems integration and software infrastructures. Users who have begun to implement object-oriented systems know "what architecture makes sense, what bottlenecks have been discovered and what the problems of implementation really are," he added.

Despite the good intentions, FDOC and CFOOT may not have quite the same promise as originally envisioned. Ultimately, the ambitions of FDOC may be bottlenecked by concerns about corporate trade secrets and antitrust regulations. "My hope is that we can decide what to discuss and what not to discuss," Mikkilineni said.

In the end, the success or failure of the groups may answer a question posed by Bohannon: "Do users drive the industry, or do vendors drive the industry?"

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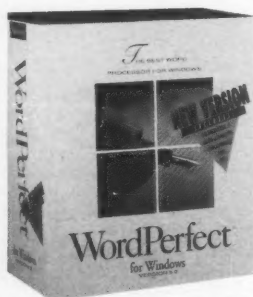
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IBI promises easier access to VAX data

By Melinda-Carol Ballou
NEW YORK

Information Builders, Inc. (IBI) is now shipping Release 2.1 of Focaudit for Digital Equipment Corp.'s VAX/VMS systems. Focaudit is a set of interactive financial auditing tools designed to make it easier for auditors to independently access data files for audit reports.

This new version of Focaudit for VMS is consistent across VAX, IBM mainframe and PC environments, which enables auditors to more easily switch among computing platforms without retraining, IBI said. Focaudit is used with IBI's Focus fourth-generation language. A new point-and-click user interface remains the same across operating systems and databases, officials said.

"Release 2.1 is all point and click to enable anyone to come up to speed quickly, but the bottom of the screen shows the [Focus] code you generate for more sophisticated users," said Sheldon Isaacson, manager of business development at IBI.

IBI is likely to release Microsoft Corp. Windows and X Window System versions of the software late this year, with support for IBM's Application System/400 platform by midyear, Isaacson said. IBI also has plans for Focaudit to run on Microsoft's Windows NT and Unix operating systems in 1994, he added.

Focaudit Version 2.1 for VAX/VMS is available now. Prices range from \$14,000 to \$66,000. Prices range from \$44,000 to \$72,000 for IBM mainframe users on DOS or VM CMS. Prices include IBI's Focus 4GL.

Get ready for

BAILOUT SOURCING

Smart IS managers are building safety valves into outsourcing pacts in case business goes sour or booms. Vendors have no choice but to follow.

N By Willie Schatz

ext time your company is tempted to sign a megabucks, multi-year outsourcing contract, remember the reality clause. Information systems managers and legal experts say a little preventive medicine could save your project, your company — and maybe even your career.

The basic idea is simple: Businesses change, so contracts should, too. Say you are locked into a five- or 10-year multimillion-dollar deal. If your business, location, assets or product mixes change dramatically, you don't want to get stuck with a pact that doesn't match your circumstances.

Take the case of Meritor Savings Bank. In April 1989, the Philadelphia-based bank was a \$12 billion colossus when it signed a 10-year, \$300 million contract with Electronic Data Systems Corp. Three years later, Meritor had closed two-thirds of its branches and had shrunk to \$4 billion in assets.

Obviously, says Larry Liss, Meritor's senior vice president of operations and technology, the bank needed far less processing services in its drastically slimmed-down state.

"We knew we had to realign the original contract with the current size of the institution," Liss explains. "We thought [downsizing] might happen, so we put a provision into the contract about downsizing even though we didn't know

Schatz is president of The Schatz Group in Washington, D.C.



LaBarge's Bill Maender says his defense-related manufacturing firm pulled the plug on a \$5 million outsourcing pact because the EDS unit couldn't keep costs down

what form it would take."

Sound like backing out? Hardly, according to IS managers, who say keeping flexible is just smart business sense.

In fact, as outsourcing continues to enjoy popularity (a recent CSC Index, Inc. survey of more than 400 top-level IS managers found 68% were outsourcing or considering doing so), more and more companies are building bailout or safety valves into their contracts.

Robert Zahler, a partner specializing in outsourcing at the Washington, D.C., law firm of Shaw, Pittman, Potts & Trowbridge, says the last two dozen or so deals he has made have included "extraordinary events clauses" designed to ensure flexibility for both client and outsourcer.

He notes that one result of the trend is that sourcing vendors are being forced to include "extraordinary events clauses" designed to ensure flexibility for both client and outsourcer. **Bailoutsourcing, page 58**

INSIDE

Commentary:
Better living
through
outsourcing

Calendar

Executive track

Page 62

Bailoutsourcing

CONTINUED FROM PAGE 57

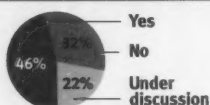
dors, including giants such as EDS and Integrated Systems Solutions Corp. (ISSC), are being forced to be more flexible when writing outsourcing deals.

"To compete in the outsourcing market," Zahler notes, "you have to have flexible product offerings instead of rigid ones. Vendors are tailoring their products to what customers are looking for."

Outsourcing: Cautious enthusiasm

While many companies are becoming wary of long-term, soup-to-nuts outsourcing deals, enthusiasm still runs high. Disaster recovery is a favorite function to farm out.

ONE OUTSOURCING WILL OUTSOURCE SOME OF ITS ACTIVITIES DURING 1993



IF YES, WHICH ACTIVITIES?

Activity	Percentage
Disaster recovery	88%
Applications development	86%
PC procurement and training/Desktop services	83%
Telecommunications/Networking	80%
Software maintenance	72%
Data center management	70%

MULTIPLE ANSWERS ALLOWED

BY COMPANY TYPE

Activity	North America	Europe
Data center management	80%	23%
Disaster recovery	80%	30%
Telecommunications/Networking	28%	19%
PC procurement and training/Desktop services	21%	28%
Applications development	19%	26%
Software maintenance	18%	21%

MULTIPLE ANSWERS ALLOWED

Source: CSC Index, Inc.

A couple of recent examples illustrate why it's worth spending time learning about reality clauses.

Flex time at Meritor

"We were running out of ideas on how to save money," Liss says. "Our budget had been cut substantially in the preceding two years [since 1990], so even though we'd reduced our expenses by 25%, we were trying to figure out how to reduce costs beyond what we'd already done." They decided to rethink the contract.

Until recently, it would have been well within standard ethics for the outsourcing vendor to say, "Sorry, guys, but that's business." But Meritor had the foresight to insert a reality clause into the contract that EDS was forced to honor.

"I'm not about to try to make up the shortfall at Meritor," says Bobby Grisham, division president of EDS' financial institution strategic

business unit.

"You can't stiff the market," Grisham says. "If I've got a long-term, fixed-price contract, I can't stick with it if the customer's business circumstances change. I'm not going to pull out my calculator and bill by the hour. My goal is to make them so... happy that they come out knowing we're the partner that helped them be successful without focusing on what that means to us."

So Meritor and EDS rolled up their sleeves and cut a more realistic deal that satisfied both partners. The original 10-year term would remain, but Meritor's cost (which Liss declined to reveal) was slashed to better reflect the bank's shrunken empire and processing needs.

For its part, EDS retained a key customer for the next seven years — and possibly longer. It also demonstrated a flexibility that could give it more muscle in future confrontations with big foes such as IBM and Andersen Consulting.

Switching in midstream

Sometimes, however, lots of elastic might not be enough. That was the case at St. Louis-based LaBarge, Inc.

The company, a \$75 million interconnect systems manufacturer with a big defense-related business, got into outsourcing for the same reasons many others do.

"Technology had passed us by," says Bill Maender, vice president and secretary at LaBarge. He describes the company's former IS configuration as the typical in-house hodgepodge from various manufacturers without much integration.

Although it wasn't losing business because of the antiquated IBM 4330-based system, LaBarge faced a huge annual maintenance cost of \$1.5 million and outdated, inadequate in-house software.

But after obtaining new software from Western Data Systems in Calabasas Hills, Calif., Maender says he discovered the software was too much for the hardware to handle. Instead of trying to re-engineer, LaBarge decided to try something new.

"We'd never done outsourcing before," Maender says, "but we elected to look at it as a potential way of reducing the total cost and time of implementation. We wanted to buy the package and get it running in seven months."

So in December 1990, the firm decided McDonnell Douglas Corp.'s McAuto unit in St. Louis was right for the job. The companies signed a five-year, \$5 million pact.

Unfortunately, Maender says, things went wrong almost immediately. LaBarge maintains that for six consecutive months, McAuto far exceeded the contractual price cap for data processing.

And despite its best efforts, McAuto — which was acquired by EDS early in 1991 — couldn't seem to deliver the work at the agreed-on price, LaBarge officials maintain.

Apparently anticipating problems, LaBarge had protected itself with an escape clause, which allowed the company to terminate the contract if costs exceeded the fixed-dollar amount. After paying consultant KPMG Peat Marwick \$40,000 to review the situation, LaBarge reluctantly pulled the plug on McAuto.

The deal was rebid, but McAuto declined to participate. The winner was May & Speh, Inc., a Downers Grove, Ill., outsourcer. Maender says the newcomer won the similarly sized deal be-

How to keep outsourcing contracts flexible

Harvest Foods, a 54-store grocery chain that recently outsourced IBM ES/9000 processing, advises potential outsourcing to carefully consider the following when drafting contracts with outsourcing vendors

- Volume growth
- Expanded scope
- New technology
- Manpower requirements
- Reason
- Associated charges
- Changing business
- Changing marketplace

Source: Harvest Foods, Inc.

One company's solution

Here's a snapshot of a company and its outsourcing methods.

The firm: Harvest Foods, Inc. is grocery market share leader in Arkansas.

Goal: To switch from a mix of older corporate IBM and NCR Corp. systems.

Decisions: Handled by a group, including the chief financial officer, chief information officer, human resources officer, general counsel and board members.

First steps: Review objectives. Then determine total IS cost, 10-year plan and budget. Finally, draft outsourcing requirements.

Action: Outsource to ISSC.

Payouts: Twenty store systems installed in two months; smooth operations; improved development structure.

Advice: Outsourcing should not be done for a quick fix or for lack of technology strategy.

Source: Presentation by Robert M. Rough, executive vice president and CFO of Harvest Foods.

cause of its attitude toward converting LaBarge's chaos into order.

"We didn't know them, but they came in and confidently said they could do the job," he recalls. "They didn't blow smoke. And their competitors didn't mesh with us the same way."

The switch seems to have paid off: Maender says his processing costs have decreased by 40% since May & Speh took over. "We'd absolutely do the same thing again," he says. "We walked away from EDS because of price, not service. Their people were concerned with the [cost overrun] problem but didn't know how to fix it. Or maybe they didn't want to. But they couldn't change their cost structure to make it viable [for us] to stay with them."

It would be a mistake, though, to presume that fear of hard times and uncertain futures are the only factors driving the new flexibility in outsourcing arrangements.

In fact, just the opposite is true at Kaiser Permanente. The San Francisco-based health care giant is just one of the many firms turning to flexible outsourcing as a means of hedging current and prospective growth.

Late last month, Kaiser inked an agreement to outsource its five smallest (but quickly growing) health maintenance organization areas to ISSC [CW, Jan. 18]. The goal, according to company officials, was to modernize technology and provide disaster recovery backup.

The contract (terms were mostly undisclosed) packs plenty of flexibility, says Andy Dubill, a Kaiser interregional services vice president. The motivation, he says, was not fear of a bust but anticipation of a boom.

Take your time

So what's the message for IS managers pondering outsourcing? Go for a multiyear, multi-million dollar contract with a monster such as EDS or ISSC and build in flexibility? Or let a smaller niche player such as May & Speh do the job from the start?

Washington, D.C., contract lawyer Harry Glasspiegel warns against jumping to conclusions too quickly.

"Each outsourcing transaction has its own set of issues and its own dynamics," says Glasspiegel, a partner in Shaw, Pittman, Potts & Trowbridge. "People should be very careful about drawing inferences or trends from a particular transaction."

He agrees with Zahler, however, that outsourcing vendors are clearly eager to play ball.

That's good news, Liss and others note, because many clients are also taking a more fragmented approach to outsourcing. Thus, vendors and buyers seem to be in the same ballpark — or at least headed that way.

"You don't need to address specifics such as downsizing in the contract," Grisham argues. "But you've got to create a framework within the contract that allows both sides to deal with swings in the customer's business. You've got to be able to move, whether the customer's business goes up or down."

Zahler is more blunt. He flatly advises against doing business with "any vendor who says they will not change a deal."

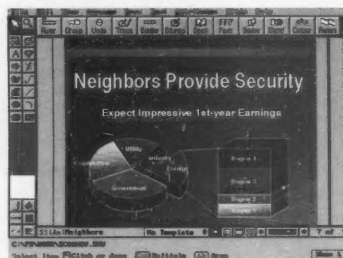
As for IS, it definitely pays to get smart about outsourcing pacts. "You're always afraid the little details are going to blow you out of the water," Maender says. "You just take the paper out there and pray like hell that it runs." •

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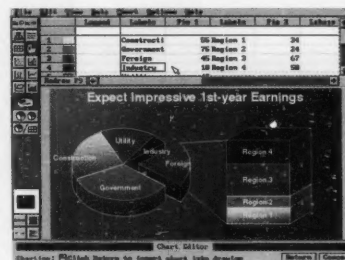
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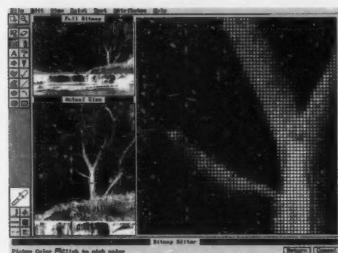


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Joseph Maglitta

Outsource for better living



What a great idea, this outsourcing! Pay someone else to do things they can do better and more cheaply anyway. But why stop at computers?

Why not expand the concept and outsource other

areas of your work and even your personal life? You'll not only create time for important things such as channel surfing but also help the economy by creating thousands of new jobs. Below are suggestions to help you get "out" there:

Snoutsourcing. Pay other people to smell things for you. This is a godsend for sinus sufferers, the olfactorily challenged and anyone who just hates things that smell bad. Perfect when purchasing fish, changing diapers, deciding whether it's time to send items to the dry cleaner, etc.

Doubtsourcing. Would your autobiography be titled *Gullible's Travels*? Are you the kind of person who believes everything — a real push-over? Then take a hint: Hire a skeptic. He'll ask the tough questions you hate, and pretty soon people will be treating you like Lee Iacocca instead of Polyanna or Gomer Pyle.

Poutsourcing. Nobody likes a poop. So why risk being labeled a malcontent or Sad Sack when you can hire a skilled and willing sour-puss to do your brooding for you? You'll feel better once you get it off his chest — guaranteed. Often packaged with the following two services:

Shoutsourcing. WHAT'S THE MATTER, IDIOT???? MAYBE YOU DIDN'T HEAR ME THE FIRST TIME! I SAID IT'S A LOT LESS WEAR AND TEAR TO PAY SOMEONE ELSE TO DO YOUR YELLING FOR YOU THAN TO GET ALL WORKED UP YOURSELF! GET IT?

Cloutsourcing. Formerly known as delegation. Hire dupes to do things for you, or better still, to tell other people to do things for you. Yell if they resist (see above). Works swell with preteen kids and (small) dogs, too.

Stoutsourcing. Think of this as a stand-in food-taster, only hungrier. Every time you see something you'd simply *love* to inhale a la Jabba the Hut, simply beckon your charge and have him scarf it for you. You'll get a real voyeuristic thrill watching him deliciously wolf down, say, that double chocolate torte, and he'll pack on all the calories! Bon appetit, Slim.

Troutsourcing. Let's face it: Sportfishing is seldom as easy as it is on *Celebrity Fish Kill with Bubba Cheeks* or those other Saturday morning video safaris. Spare yourself (and maybe your kids and pals) the embarrassment: Pay a pro to take the kids fishing. They'll be sure to catch more than gnat bites, and you'll be a cinch to land a "Dad/Mom of the Year" trophy from the delighted little bait tossers.

Scoutsourcing. Similar to above. Sure, you want to be a great dad or mom. But do you really want to know that much about mealworms, garbage-eating microbes or slip knots? Are you truly eager to tromp miles out into the chilly foothills to Camp Damp, to arise miserable and foggy at dawn and vainly scavenge for a few pitiful twigs to burn in an evil, smoky fire that will heat some unidentifiable freeze-dried and salty skank from a tinfoil pouch? AND DRINK INSTANT COFFEE!!!! I didn't think so. Hire a pro from the local gun shop instead.

Checkoutsourcing. There's nothing more irksome than waiting in the supermarket checkout line watching some baffled teenager go BLEEP BLEEP BLEEP in vain hopes of getting the bar code reader to work. Attention shoppers: Pay someone to stand in line for you, and go read *The Star* where you should — in the commode.

Groutsourcing. An old favorite. You needn't be rich to pay someone to get down on his knees and scrub your bathroom tiles with a brain-melting toxic substance and an old fingernail brush — just lazy, busy or deathly afraid of anything growing under your sink that looks like shepherd's pie.

Let-it-all-hang-outsourcing. A naughty one that's fun, especially at company picnics and Christmas parties. Measure your surrogate party animal for lampshade, toga size and favorite cocktail and watch his once-promising career sour like the guacamole while you coolly sip Perrier and lime from the sidelines. See you at the top, you nut.

Maglitta, senior editor, features, paid someone to write this column.

Calendar

FEB. 7 - FEB. 13

1993 User Data Management Systems User Conference. Keystone, Colo., Feb. 7-10 — Contact: Rebecca Campbell, Interactive Software, Keystone, Colo. (303) 987-1001.

Document and Image Management Systems Conference. Lake Buena Vista, Fla., Feb. 7-10 — Contact: BIS Strategic Decisions, Norwell, Mass. (617) 982-9500.

Managing Enterprise Networks Conference. San Francisco, Feb. 8-10 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3870.

Expo Comm Mexico '93. Mexico, Feb. 9-12 — Contact: Ben Stauffer, E. J. Krause & Associates, Inc., Bethesda, Md. (301) 986-7800.

FEB. 14 - FEB. 20

1993 Symposium on Applied Computing. Indianapolis, Feb. 14-16 — Contact: Association for Computing Machinery, New York, N.Y. (212) 869-7440.

International Society for Hybrid Microelectronics (ISHM) Advanced Technology Workshop: Advanced Materials, Processes and Interfaces. Ojai, Calif., Feb. 15-17 — Contact: ISHM/IEEE Workshop Registration Desk, Reston, Va. (703) 471-0066.

Western Communications Forum '93. Phoenix, Feb. 15-17 — Contact: Western Communications Forum, Chicago, Ill. (312) 938-3500.

Downsizing Expo. Chicago, Feb. 16-18 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

Mobile '93 Conference and Trade Show. San Jose, Calif., Feb. 16-18 — Contact: Technologic Partners, Larkspur, Calif. (415) 924-1274.

Adobe Technology Exchange Expo (ATXPO) Conference and Exhibition. Santa Clara, Calif., Feb. 16-19 — Contact:

ATXPO '93, Santa Clara, Calif. (408) 562-6104.

Distribution/Computer Expo '93 West. Anaheim, Calif., Feb. 17-18 — Contact: C. S. Report, Uwchland, Pa. (215) 458-6410.

FEB. 21 - FEB. 27

SynOptics Users Group Conference. Monterey, Calif., Feb. 21-24 — Contact: SynOptics Users Group, Santa Clara, Calif. (408) 988-2400.

The Software Development Exhibition and Conference '93. Santa Clara, Calif., Feb. 22-26 — Contact: Software Development Conference '93, Carrollton, Texas (214) 245-6012.

1993 Government Imaging Conference and Exposition. Bethesda, Md., Feb. 23-26 — Contact: USPDI, Inc., Silver Spring, Md. (301) 445-4405.

Compton Spring '93. San Francisco, Feb. 22-26 — Contact: John Barr, Motorola, Inc., Rolling Meadows, Ill. (708) 576-8706.

Software Development '93. Santa Clara, Calif., Feb. 22-26 — Contact: Miller Freeman, Inc., San Francisco, Calif. (415) 905-2741.

The Networking Management, Interconnectivity and Security Symposium. New York, Feb. 24-25 — Contact: Association for Information Technologies, Kings Park, N.Y. (516) 269-6713.

Planning for Integrated Information Systems. Orlando, Fla., Feb. 24-25 — Contact: Barnett Data Systems, Rockville, Md. (301) 762-1288.

Seventh Annual Users Conference. Salt Lake City, Feb. 24-26 — Contact: Watsch Computer Technology, Salt Lake City, Utah (801) 575-8043.

The 1993 Prepublishing Conference and Exhibition. Feb. 24-27 — Contact: Graphics Arts Show Co., Reston, Va. (703) 264-7208.

Executive

Track

Joseph Brophy, long an outspoken advocate of the importance of information systems in the insurance and health care arenas, will retire from his current post as president of the **Travelers Managed Care and Employee Benefits Operations** unit of Hartford, Conn.-based **The Travelers Corp.**, effective March 31. **Richard Booth,**

Travelers' president and chief operating officer, will assume Brophy's duties.

In Northampton, Mass., **Herb Nickles** has been named director of information systems at **Smith College.**

Nickles, a veteran of IS in academia who most recently served as director of academic computing at New Orleans-based **Loyola University**, is charged with spearheading IS and communications advances at Smith.

He will also manage the Office of

Information Systems, which coordinates academic and administrative computing and campus networks.

He replaces **Charles Staelin**, who has returned to his full-time teaching post in the college's economics department.

State University College in Cortland, N.Y., has a newly created position — associate vice president for information resources — and the person to fill it: **Paula Warnken**, who has served as director of libraries at Cincinnati-based **Xavier**

University since 1984.

Effective March 15, Warnken will be responsible for planning, coordinating and budgeting IS on the Cortland campus, as well as working with statewide committees to develop information resources and networks.

Gary McCarty is the new MIS manager at the Washington, D.C.-based **Electronics Industry Association (EIA).** Before joining the EIA in 1992, he served as a computer specialist and instructor at **Haliburton Industries.**

Have you or a colleague in the information systems field recently been promoted? *Computerworld* would like to share the news with the rest of the IS community. Please contact Senior Editor **Nell Margolis** at 1-800-343-6474 to pass the news along.

The CW Guide to Presentation Tools

This is not a TOY



Presentation tools are serious business for sales and marketing — they're a basic means to a good image

By Linda Musthaler

You might think that presentation graphics software is a trivial thing, not worth your time or interest. But from a business perspective — and especially a sales and marketing perspective — it is a serious tool.

Image counts for a lot in sales, and these products play a strong role in how a client views your company when the presentation is through. Even for internal use, sales departments very much want to make a lasting impression on the head of sales. Presentation software can't do everything, obviously; but a poor system can wreak a lot of damage.

In reality, though, most sales and marketing staffs get little support from the information systems staff with selecting and even learning how to use their presentation software. Most companies see presentation graphics as a "localized need," leaving support and purchase decisions to individual business departments.

This mind-set can cause presentations to suffer, leading to a disjointed public image of the company. Have you ever seen a sales pitch where the salesperson obviously was not comfortable with the presentation tools? Or had handouts that were unclear and hard to follow? If yes, you probably walked away less interested in the product and the company than you were before.

How much support is enough? At the very least, IS should set the standards for the products to buy, in terms of platform, software and peripherals. It should also provide product updates, as well as help desk support and training on the mechanics of using the product.

Knowing your audience

Before selecting a package, you have to understand the needs of the sales and marketing departments. For one, they won't be satisfied with the presentation capabilities embedded in word processing or spreadsheet packages.

Great sales presentations incorporate heavy-duty elements and require a variety of features. Fortunately, most of the high-end presentation graphics products available to-

day suit sales and marketing needs.

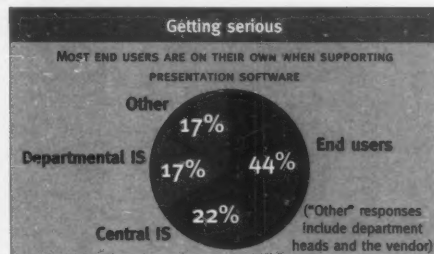
In fact, vendors have all but ceased leapfrogging each other with new features; instead, they are making the creation process more efficient by taking the burden of presentation design and placing it on the application software.

For example, all of the high-end products today offer chart styles with a gallery of options. If the user chooses a bullet chart, the package automatically determines the bullet style, places the text, sizes the font and sets colors for bullets and the background. Thus, the presenter can concentrate on the content of the message rather than on the show itself.

Available products either are highly specialized — those that do one or two things very well — or are integrated products with a range of features.

For instance, there are a number of multimedia products that give life to otherwise sedate slides by adding sound and video capabilities.

Though many typical presenters have at least experimented with screen shows, multimedia presentations are not yet meant for the average sales staff. Instead, they are still for those with the time, money and design skill to create a polished result. •

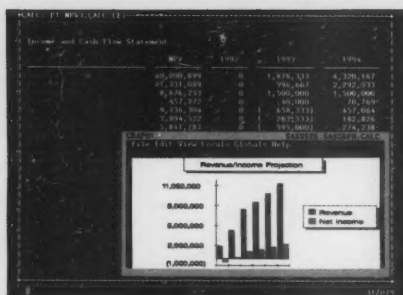


Source: Computerworld Buyers' Scorecard

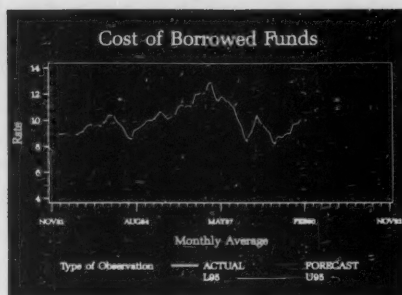
inside

- Will your presenters be taking their show on the road . . . and other important considerations? Page 65.
- Asymetrix' Multimedia Toolbook development kit earns kudos from reviewers. Page 70.
- Aldus' Persuasion for the Macintosh tops three Windows heavyweights in presentation graphics buyer satisfaction. Page 66.
- Multimedia update. Page 69.

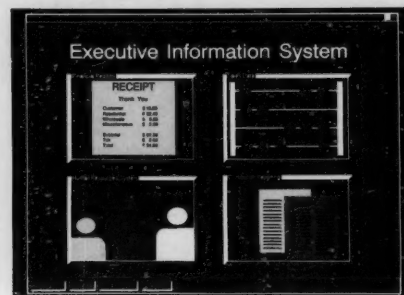
Musthaler is an industry analyst at Currid & Co., a Houston-based consulting firm.



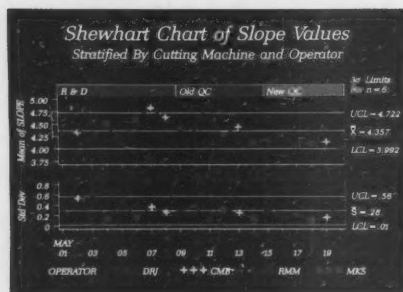
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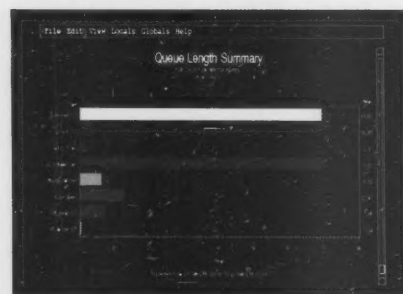
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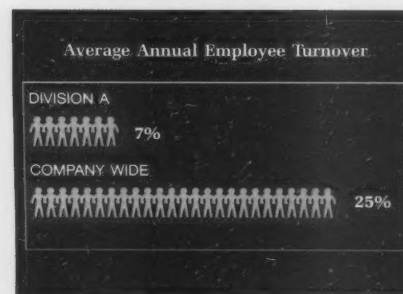
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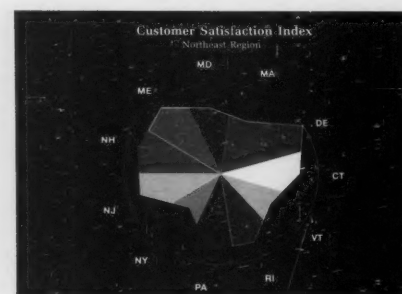


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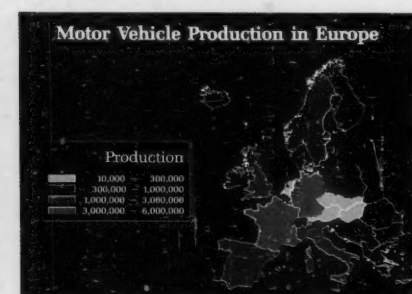
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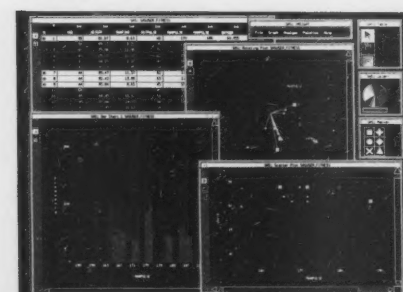
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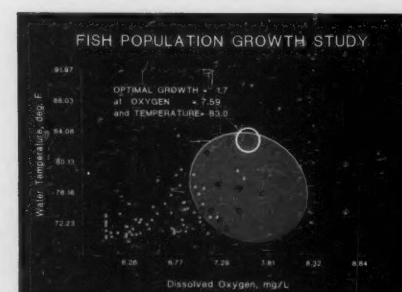
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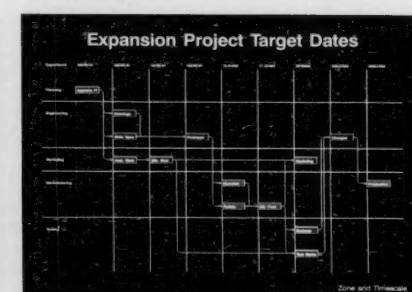
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- 23. Dir./Mgr. Sys. Development, Sys. Architecture
- 31. Programming Management, Software Developers
- 41. Engineering, Scientific, R&D, Tech. Mgt.
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Presentation Tools

What's behind the polished image

By Linda Musthaler

"Old reliable" ... but with a sizzle. The king of simplicity ... but capable of making an impact.

That's what sales and marketing departments most likely want in a presentation system. After all, salespeople not only have to be smooth and ultraprofessional, but they also have to get noticed.

How will you find out their requirements? Ask them! Here are the most crucial categories to query. Have them rate these categories in terms of what's most important to them.

Operating system

On which platform are the best presentation packages available? Traditionally, the Apple Computer, Inc. Macintosh has been known for its superior graphic capabilities, but Microsoft Corp. Windows is becoming more widely used than Macintoshes.

Most new developments in graphics capabilities are on Windows, and it offers better product integration, allowing a presenter to mix and match chart types, clip art and even video from many sources.

DOS is also still viable, and the OS/2 market is playing catchup on the desktop.

If your company needs a mixed environment, select products from software vendors that are committed to several platforms. For instance, Microsoft's PowerPoint is available for both Windows and the Macintosh.

Openness

If users have many other computing resources at hand, you'll want the system to interoperate with them; for instance, it should support a good variety of add-ons and pe-

Portability

On-screen presentations given at the client's site can be more flexible and have more impact than paper output; as a result, most corporate "road warriors" will want to create and display their presentations all on the same machine.

Fortunately, most laptop and notebook systems are capable of running desktop presentation software. The size of the audience should dictate the equipment required. For audiences of one or two people, running a screen show on a laptop is adequate. With larger groups, an external monitor is recommended. When multimedia is used, extra storage is necessary, which notebooks often don't have, requiring a CD-ROM or extra hard disk.

It's a simple thing to add extra tools such as large-screen monitors, sound boards and speakers, but there is a practical limit to the amount of external devices a traveling salesman can take with him. Some of the equipment, such as large-screen monitors, projectors and LCD panels, is also expensive to buy, lease or rent.

If you're intent on a full-scale production, you may want to ask about the client's facilities. Large firms usually have fully equipped conference rooms that can support a presentation and save you the effort of carrying equipment with you.

Ease of use

Many products are easy enough to use without any formal training. Good tutorials cover the basic features and get a user up and running in less than 15 minutes. If certain users in the group won't be using the graphics package every day, the product should be easy to use on an infrequent basis as well. A new feature from Microsoft called Wizards prompts users through difficult tasks, one step at a time. Design elements such as chart galleries also ease use by offering a number of charts to use in your presentation.

Sophistication

Most sales departments will want the resulting presentation to be sophisticated enough to suit a variety of audiences. Your job is to make sure the presentation package can produce shows that are appropriate for the intended audience.

To add a sophisticated touch, an "interactive presentation" feature allows users to change the path of the presentation while it's being given.

Sophistication can also be achieved through products that can launch other applications from within the show. For example, if sales figures are being reviewed, users can show sales performance within the last two years by launching a spreadsheet with the data.

You may even want to look for a package that can do some of the design and layout work for the user, such as choosing the background color, chart style and font size.

GUI support

Though a graphical user interface (GUI) is not required for graphical work, it helps to have one when working with clip art and cutting and pasting objects between presentations. For instance, Windows' Clipboard enables clip art to be used and stored while maintaining the integrity of the objects. With DOS, transferring clip art is a more involved process, resulting in some loss of the object's integrity. GUIs also minimize the relearning curve for infrequent users because the interface remains standard. The device drivers of many output devices are also supported. *

Of 962 respondents, 64% plan to purchase presentation software in the next year, according to the Computerworld Database Division.

Market share

FOLLOWING ARE THE TOP 3 PRESENTATION GRAPHICS PRODUCTS IN THREE CATEGORIES IN TERMS OF U.S. UNITS SHIPPED

DOS	Macintosh	Windows
Software Publishing Corp.'s Harvard Graphics	Microsoft Corp.'s PowerPoint	Microsoft's PowerPoint
WordPerfect Corp.'s DrawPerfect	Deltapoint, Inc.'s DeltaGraph	Micrografx, Inc.'s Charisma
Lotus Development Corp.'s Freelance	Aldus Corp.'s Persuasion	Lotus Development's Freelance for Windows

Source: International Data Corp.

ripherals. It should also be able to exchange files with other existing applications and be compatible with many other products for input, output, clip art, data import and other features.

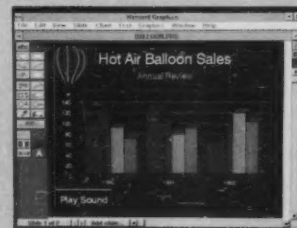
Scalability

Users of the system might range from the head of sales to an intern. To ensure that a system will be viable for a variety of users, try to standardize on one or two presentation graphics products.

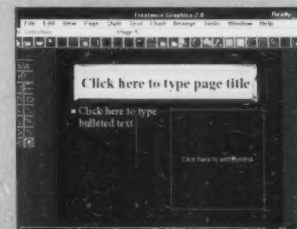
Scalable, high-end systems such as Software Publishing Corp.'s Harvard Graphics and Lotus Development Corp.'s Freelance are good choices because they are easy enough for the beginner yet have sophisticated features for the expert.

You may also want to consider opting for a high-end package and letting your users grow into it. Also, keep the door open for sound and video extensions because they will likely be important in the future as more people become accustomed to multimedia.

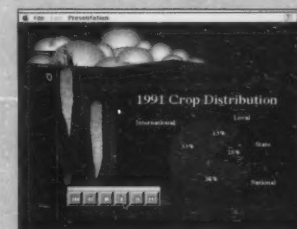
HIGH-END FEATURES



Adding sound to presentations: With the "launch application" dialog box, you can set up files containing prerecorded sound clips. By pressing the "sound" button, you can play the sound during the presentation. (Pictured: Software Publishing Corp.'s Harvard Graphics for Windows.)



Design help with built-in aids: Templates — called "Smartmasters" on Lotus Development Corp.'s Freelance — give users "click here to" prompts for entering titles, subtitles, text and graphics directly into ready-made presentation pages. (Pictured: Lotus' Freelance Graphics for Windows Release 2.0.)



Runtime versions: A button bar enables presenters to navigate backward and forward, either automatically or manually through a slide show. This runtime version allows the slide show to be viewed without the presentation software. (Pictured: A slide created in Aldus Corp.'s Persuasion and saved as a Persuasion Player — a runtime version of the show.)

Presentation Tools

Buyers' Scorecard: Persuasion bests presentation software competition

By Derek Slater

Presentation graphics software for Microsoft Corp.'s Windows is one of the fastest growing application categories. According to the Software Publishers Association, retail revenue from Windows presentation graphics packages was up 250% in 1992.

However, a contender from the Apple Computer, Inc. Macintosh platform topped three leading Windows packages in this week's Buyers' Scorecard user satisfaction survey.

Aldus Corp.'s Persuasion for the Macintosh earned an overall tally of 75. Microsoft's PowerPoint and Lotus Development Corp.'s Freelance Graphics Windows packages scored 72 each. Software Publishing Corp.'s Harvard Graphics for Windows followed with a score of 67.

Aldus' Persuasion outscored the other products in support for data and graphics import, value for the dollar and color controls. It also took the highest mark for speed, though none of the products impressed users in that area.

In verbatim responses, Persuasion's users indicated that the product yields professional-looking presentations; they also noted that the outlining tool is a particular strength.

Microsoft's PowerPoint topped the most important category: ease of use. PowerPoint is a market share leader on both the Windows and the Macintosh platforms, aided by its inclusion in Microsoft's Office product suite. Users said PowerPoint's interaction with other Microsoft applications was an important strength.

However, the product lagged behind its com-

petition in numeric and text charting, where users must rely more heavily on importing data, as opposed to creating charts within PowerPoint.

Freelance Graphics, which is bundled into Lotus' SmartSuite for Windows, took highest honors in quality and variety of templates and drawing tools but trailed behind PowerPoint and Persuasion in ease of use.

The DOS market share leader, Harvard Graphics, has found the Windows market hard to crack. The product trailed notably in ease of use and value for the dollar.

Last month, Software Publishing beefed up the product's multimedia capabilities by introducing an add-in Video Player for Harvard Graphics. Video Player allows users to incorporate scalable digital video clips into screen shows.

Graphic diversity

Interestingly, close to one-third of the respondents said they currently use more than one presentation graphics package. Users' top desired improvement for the products was a greater number and variety of presentation templates. The need for enhanced data import capabilities was also mentioned frequently.

Buyers' Scorecard records users' satisfaction with their installed technologies. Users assigned 1-to-10 ratings based on their satisfaction with their presentation graphics software in 16 specific categories.

All categories were factored into the final scores. The scores for each product in the seven most important categories are listed in the tables below. *



Interestingly, close to one-third of the respondents said they currently use more than one presentation graphics package.

Presentation graphics software

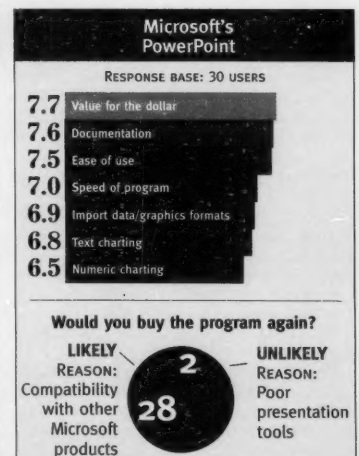
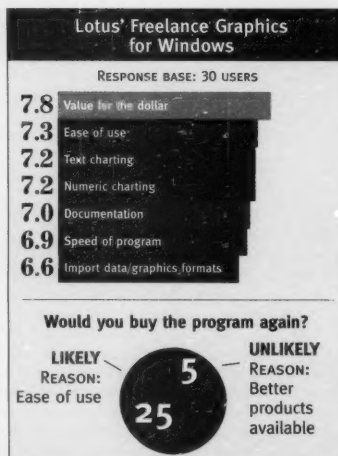
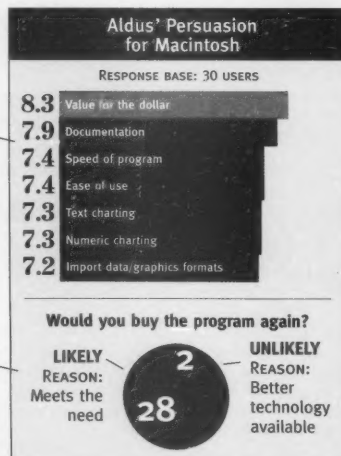
Total scores reflect average user ratings for all measured areas, weighted by user-assigned importance. Response base: 30 users for each product.

TOTAL POSSIBLE SCORE **100**MEAN SCORE **72**

PRODUCT	PROS	CONS
Aldus' Persuasion for Macintosh SCORE 75	"IT'S FLEXIBLE — YOU CAN USE MULTIPLE TEMPLATES AND COMBINE TEXT AND GRAPHS."	"IT'S HARD TO ENSURE THAT YOU ARE GOING TO GET QUALITY COLOR OUTPUT."
Lotus' Freelance Graphics for Windows SCORE 72	"EASY TO USE WITH GREAT CHARTING CAPABILITIES."	"IT'S SLOW AND TAKES UP A LOT OF HARD DISK SPACE."
Microsoft's PowerPoint for Windows SCORE 72	"IT'S EASY TO USE AND GIVES CRISP COLOR OUTPUT."	"IT'S SOMEWHAT SLOW AND DOESN'T HAVE ENOUGH OPTIONS FOR CHARTS."
Software Publishing's Harvard Graphics for Windows SCORE 67	"IT HAS A LOT OF FEATURES." "THERE'S QUITE A BIT OF CLIP ART."	"IT'S SLOW AND NEEDS TO BE MORE USER-FRIENDLY."

Ratings are based on a 1-to-10 scale, where 10 is best.

Reasons are based on the most frequently stated answers.



Presentation Tools

Worthwhile elements

Some features are better than others

Vendors are no longer climbing over each other to offer the latest and greatest presentation features. The big push today is to incorporate features that make the whole effort more efficient. The most worthwhile of these can be classified in three categories: design, presentation and productivity elements.

design elements

Mainly found in high-end products, these features facilitate the layout and design of a presentation. Also thought of as "design intelligence," they provide built-in expertise that controls and recommends colors and font sizes, alignment, background options, positioning and sizing of elements within a presentation. Here are some popular design features:

- **Chart galleries** give you a collection of chart types and styles to choose from, such as three-dimensional pie charts and stacked bar charts.
- **Templates** allow you to set a standard design for repetitive work.
- **Text layout** controls the placement and style of text on the charts.

Getting it all

Look for a system that provides many output choices, including printed copies, transparencies, slides, screen shows and other media as required. Design work such as digitized logos and corporate templates can be important as well.



- **Color palettes** provide a predetermined set of colors that contrast with or complement each other.

presentation elements

These features were designed to improve the presenter's delivery and enhance a lasting message, which is important for sales and marketing. Most of these features, listed below, are found in high-end products:

- **Screen shows** are a method for delivering the entire presentation on the PC screen. Most high-end packages also allow screen shows to be created and compiled. From there, they can be put onto a floppy disk and sent to a client to watch on a PC that does not run any presentation graphics software.
- **Interactive presentations** are a means for changing the path of the presentation as it is being given. For example, if a sales representative is making a point and wants to give extra detail, he can drill down to additional slides containing the information. But if he chooses to skip over them, he can.

- **Transition effects** control the way the presentation progresses from one slide to another. Instead of having the screen change abruptly between slides, a smooth rain or fade effect can be used.

- **Multimedia extensions** jazz up the presentation with support for audio and video to corroborate the text and graphic images.

productivity elements

Most presentation graphics packages have a set of productivity features that are meant to make the product easier to learn and use.

- **On-line tutorials** provide a quick overview of how to get started with the product. This is important for infrequent users.
- **Wizards** step the user through a difficult function with prompts, acting like an on-line tutorial that works with your live data.
- **Data import/handling** takes data from many sources (spreadsheets, databases, direct entry) and charts it in appropriate layouts (pie charts, bar charts, etc.)

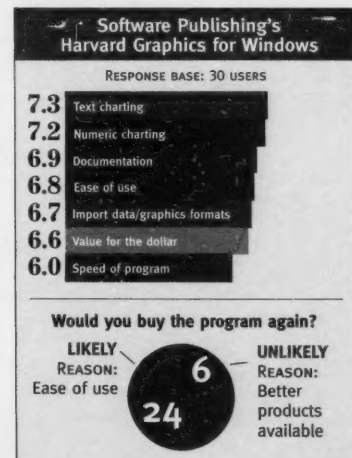
— Linda Musthaler

METHODOLOGY

User names were obtained from nonvendor sources. First Market Research Corp., an independent market research company in Austin, Texas, conducted the survey and tabulated the results. The response base was 30 users per product.

The ratings categories, in descending order of importance, were as follows: ease of use, support for importing data and graphics formats, documentation, value for the dollar, speed of the program, text charting, numeric charting, responsiveness of vendor service, text editing, quality of vendor support, drawing tools, color controls, notes and handouts, quality and variety of templates, outlining and on-screen organization of presentations.

To compute the overall score for each product, we performed the following steps: 1) Multiply the product's score in the first category by the user importance rating for that category to obtain the weighted score. 2) Repeat the process for all remaining categories. 3) Average the resulting figures for the average weighted score. 4) Convert the average weighted score to base 100; the ratio of the average weighted score to the average user importance is equal to the ratio of the overall score to 10. Numbers were rounded off where necessary.



Vital Statistics

The response base included chief information officers, vice presidents and information systems directors (10), IS managers (37), systems analysts (8), technical support staff (31) and others (34). Of the respondents, 65% use their software to develop slide presentations, 57% develop paper presentations and 27% create on-screen presentations.

Acknowledgments

Computerworld thanks the following firms for their assistance in preparing this Buyers' Scorecard: Computerworld Database Division and International Data Corp.

Quick. Think of a company with a much broader line of business UNIX computers than IBM.

Presentation Tools

Popular packages' true colors

By Alice Bredin

Sales and marketing staffs can pull together a presentation in less than an hour with presentation software. But there are lots of packages from which to choose. Users talk about the pluses and minuses of their products.

Software Publishing Corp.'s Harvard Graphics and Lotus Development Corp.'s Freelance for Windows.

User: Art Silverglate, PC specialist, network administrator, Land Rover North America, Inc., Lanham, Md.

Primary use: Presentations to dealers (Harvard Graphics), in-house documentation (Freelance).

Pluses: "Harvard Graphics is easy to use; our people learned it themselves with some class time. Lotus, however, is faster and has WYSIWYG capabilities. We can al-



Most people use overheads, slides and handouts for their presentations, according to a Buyers Scorecard survey. Fewer use videos (18%) and PC-based presentations (21%).

so set it up so users can only get to certain menus."

Minuses: "Harvard has features that Lotus doesn't, such as the ability to scan in a picture — say a Range Rover. But Harvard Graphics doesn't let you move back and forth between graphics and spreadsheets."



Lotus' Freelance for Windows.

User: Tony Gleicher, brand research manager, PepsiCo

Co., Somers, N.Y.

Primary use: Handouts for presentations to management and promotional material for sales managers.

Pluses: "What makes it unique is the ease with which you can customize the Smart Masters. I also like the ability to toggle between

black-and-white and color. A small but simplifying feat is the way clip art is seamlessly integrated as part of a tool box on the screen."

Aldus Corp.'s PageMaker, Corel Systems Corp.'s CorelDraw, Microsoft Corp.'s Word, Lotus' Freelance for Windows.

User: Cathy Gisdispenza, graphics specialist, Scudder, Stevens & Clark, Inc., a New York investment firm.

Primary use: In-house and client presentation material, such as portfolio performance presentations that show people what their money looks like.

Pluses: "CorelDraw is good for creating company logos, and Freelance is good for bar charts. Word and PageMaker make some pretty text. For the most part, I create graphs and pictures in Freelance or Draw and bring them into PageMaker. It's pretty easy to move things around."

Minuses: "Freelance for Windows is easy but buggy. I understand the new release will change all that. Freelance also doesn't have rulers, and I never know if I'm on the page. It makes my eyes get buggy after a while."

WordPerfect Corp.'s WordPerfect Presentations 2.0 for DOS.

User: Richard Wilkinson, controller, Universal Enterprises, Provo, Utah.

Primary use: Business presentations, forms, in-house flyers, logos and graphics for newsletters.

Pluses: "The real plus is it looks like Windows, and it can be used with a mouse. It has pull-down menus and help functions."

Minuses: "There is no ability to scale your drawings when you print."

Software Publishing's Harvard Graphics 3.0.

User: Rick Jacobson, PC technician, analyst, George A. Hormel & Co., Austin, Minn.

Primary use: Presentations for new sales hires and for sales force reference materials.

Pluses: "We support 65 sales offices, so it's important to have a product that's easy to train on. Harvard Graphics' menuing system is straightforward."

Minuses: "It has a speed problem. It's slow for detail or background. I understand that Version 3.05 speeds it up."

Bredin is a free-lance writer based in New York.

On the market

Most presentation software systems offer at least one of three operational modes: word charts, graphs and drawing. Some integrate all these modules, while others sell them separately. The integrated products tend to be easier to use and more conservative on disk space.

High-end integrated packages

Best used for: Everything from basic charts to dazzling slide shows.

Price: \$495 to \$595 retail.

Features: Custom templates, interactive presentations, design intelligence, multiple transition effects, gradient backgrounds, compiled or runtime screen shows, Object Linking and Embedding support for Windows applications, support for graphics images and advanced output devices.

Many of the high-end integrated products are available for DOS and Windows. Microsoft's PowerPoint and Aldus' Persuasion are also developed for the Apple Computer, Inc. Macintosh.

Product sampling: Software Publishing's Harvard Graphics, Lotus' Freelance Graphics for Windows, Microsoft's PowerPoint, WordPerfect's Presentations for Windows, Micrografix, Inc.'s Charisma.

Low-end integrated packages

Best used for: Word and text charts.

Price: \$99 to \$199 retail.

Features: All products include basic charting and drawing features but may not include design aids, screen shows and the other features mentioned for high-end packages.

Product sampling: Computer Associates International, Inc.'s CA-Cricket Graph for Windows, Zenographic, Inc.'s Pixie, Spinnaker Software Corp.'s PFS:First graphics.

Drawing and painting tools

Best used for: Drawing and painting.

Price: \$595 to \$695 retail.

Features: These programs mainly have strong drawing or painting capabilities. They may include some features for charts and screen shows.

Product sampling: Corel's CorelDraw, Computer Support Corp.'s Arts & Letters Graphics Editor and CA's CA-Cricket Paint.

Desktop presentation packages

Best used for: Desktop presentations.

Price: \$95 to \$795 retail.

Features: Import charts and drawings from other packages and add animation, video and other capabilities.

Product sampling: Gold Disk, Inc.'s Animation Works Interactive, Macromedia, Inc.'s Action, Autodesk, Inc.'s Autodesk Animator Pro for Windows, Asymetrix Corp.'s Make Your Point and Eclipse Technologies' Madison Avenue.

— Linda Musthater

Quick. Think of a company with better business UNIX price/performance than IBM.

Presentation Tools

User view

Sound, vision add presentation punch

By Robert M. Knight

When Joseph Duncan consults the oracles of the economy, people listen. And they watch.

As vice president and chief economist at The Dun & Bradstreet Corp. in New York, Duncan presents his views throughout the U.S. and the world as many as three times a week.

But unlike many economists, who are often technology-shy, Duncan has trained himself to be an expert in computer-generated graphics and animation.

When Duncan made a November presentation to his most important audience, the D&B board of directors, he was able to dress it up not only with static graphics but also with videotape digitized to fit the CD-ROM drive that supports his presentations. In one instance — as part of a D&B team overseeing a joint venture in the former Soviet Union — he included in his core presentation footage of Russians lining up for food and commodities.

"I [have] a PC with a CD-ROM drive and internal speakers and plugs for various kinds of inputs from internal sources. I juiced it up with a 1.2G-byte SCSI drive because when you're doing digitized video, it burns up a lot of storage space," Duncan says.

Duncan started out with an IBM program called Hollywood, which IBM has since sold to Claris Corp. "Hollywood is a good way to get dynamic graphics that grow easily on the screen," he says.

System support

Today, Duncan uses Harvard Graphics, a package from Software Publishing Corp. in Mountain View, Calif. The package includes several support programs, including Linkway, which captures digitized video.

Among the benefits of using multimedia is that Duncan no longer has to pay a commercial film lab for each image in his presentation. He was spending \$8 to \$10 for each slide.

Nor does he have to worry about updating his visuals every time something changes in the economy. He keeps his data updated daily on a Microsoft Corp. Excel spreadsheet, which drives the graphics.



Joseph Duncan, vice president and chief economist at The Dun & Bradstreet Corp., has trained himself to be an expert in computer-generated graphics and animation.

"When you're making, on average, one presentation a week, and that used to mean paying \$400 to \$500 a week [for updated slides], it doesn't take long to save a lot of money," Duncan says.

Although Duncan uses the Software Publishing product now, "we're constantly looking at other things," says John Wu, a New York multimedia consultant who works on contract with D&B. "Harvard Graphics isn't the easiest system to use, but we feel that the strengths it has in presentation flexibility far outweigh any small disadvantages.

"It uses 'hyperlinks' to let you go from slide to slide within a presentation, instead of being bound by the normal linear sort of program like you get with a 35mm slide presentation," Wu continues. "With hyperlinks and a set of backup slides, Joe can go to a particular graphic if he needs to, especially during question-and-answer sessions."

Certain technology advancements need to be made to take full advantage of multimedia.

"Obviously, there are hardware issues," he says. "At the moment, full-motion video needs a special part from Intel or IBM that supports digital video interaction. Until recently, you needed a card to play digital video on-screen. But now Microsoft has announced Video for Windows, which lets you play back video without a special card."

A multimedia PC standard is also needed, as well as more support for CD-ROM, Wu says. "As file sizes get larger, we need a medium that can store very, very large amounts of data."

Knight is a free-lance writer based in Chicago.

On-screen presentations

Sophisticated users should give serious thought to on-screen presentations. These are different from desktop presentation packages because the transition between slides is smoother. Today's PCs can easily be configured for dazzling productions, including sound, video and animation, by simply adding a sound board, a set of speakers and software extensions (such as Microsoft's Video for Windows).

Multimedia update

Of 126 respondents, most are not multimedia users, but a fairly decent minority are employing the technology

Yes: 37% No: 63%

Most say the investment is "worth it"

"Expensive but worth it" 26
"Too expensive" 11
"Good results for a low price" 8

Those that use multimedia have common purposes

Training 20
Sales presentations 20
Internal presentations 19
Other 8

Enhanced communications is the biggest benefit

More effective internal communications 19
Better trained employees 11
Increase in sales 9
None 3
Other 11

(Multiple responses allowed)

(Multiple responses allowed)

Numbers were rounded off in all charts.

Source: Computerworld Buyers' Scorecard

HIDDEN COSTS

Add-on clip art packages, expensive output choices and special hardware needs (such as video boards and digitizing tablets) can drastically add to the cost of presentations. However, presentation packages can also save a lot of money. Julie

Sall, director of marketing at MathSoft, Inc. in Cambridge, uses Lotus Development Corp.'s Freelance for Windows and saves about \$5,000 a year. "I used to pay \$100 per slide to a design firm, and it took two weeks to get them," she says.

Quick. Think of a company with a better business UNIX environment than IBM.

Presentation Tools

Technology Analysis: Asymetrix's Multimedia Toolbook good overall value

Reviews	Ease of learning	Ease of use	Performance	Documentation	Programming environment	Media/Data import	Animation	Support	Overall value
<i>InfoWorld</i> 3/9/92	Easy to get started	Components are well-integrated	Robust	Very thorough	Rich language	Wide range	Good	Poor	Great deal with few weaknesses
<i>PC Magazine</i> 3/31/92	Plenty of examples	Takes significant skill work	Slow	Difficult to master	Not always intuitive	NC	Weak	NC	Plenty of flexibility
<i>PC Week</i> 6/29/92	Excellent	User-friendly design	Winner	Well-communicated	Flexible	NC	NC	NC	Fundamental simplicity

Users

Henry Welch, National Association of Realtors	■	■	■	■	■	■	NC	■	Really happy with it
Michael Lawrence, Multimedia developer	■	■	■	■	■	■	■	■	If I could, I would have written it
Mick Mortlock, Intel Corp.	■	■	■	■	■	■	■	■	Having phenomenal success with it
Brigitte Ludgate, Defense Language Institute	■	■	■	■	■	■	■	■	Should be constantly updated

Analysts

Nick Arnett, Multimedia Computing Group	■	■	■	■	■	■	■	■	Good application
Bill Caffery, Gartner Group, Inc.	■	■	■	■	■	■	■	■	Super value

Key: ■ Very good ■ Good ■ Fair ■ Poor Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey. NC: No comment.

Asymetrix Corp.'s Multimedia Toolbook is an object-oriented programming environment designed to create multimedia productions. Based on Version 1.5 of Toolbook, the company's Windows-based authoring tool, the product offers additional animation files, sound, video and commands and tools to access CD-ROMs.

Reviewers said users will be pleased with Multimedia Toolbook's programming environment and its media/data import capabilities of importing bit-mapped files in a variety of file formats, but some reviewers were less than thrilled with its animation and documentation.

Ease of learning: Sample applica-

Vendor background data

BELLEVUE, WASH.-BASED ASYMETRIX IS A PRIVATELY HELD FIRM THAT DOES NOT DISCLOSE FINANCIAL INFORMATION. ACCORDING TO THE COMPANY, THE ESTIMATED COMBINED INSTALLED BASE FOR MULTIMEDIA TOOLBOOK AND TOOLBOOK—ASYMETRIX'S AUTHORIZING TOOL—IS MORE THAN 100,000 COPIES. DURING 1992, MULTIMEDIA TOOLBOOK WENT FROM GARNERING 5% TO 65% OF THE COMPANY'S REVENUE.

tions help teach users how to copy and paste objects, scripts and entire pages.

Ease of use: Nearly every Toolbook application is based on scripts, so knowledge of OpenScript—Multimedia Toolbook's programming

language—is necessary. Learning OpenScript proved to be time-consuming for some reviewers, while for others mastering it was a breeze.

Documentation: *PC Magazine* described the documentation as disorganized. Reviewers had to sift through four or more manuals to make a specific feature work.

Programming environment: The product supports all standard programming constructs, including branching, looping and case statements. A wide scope of string manipulation tools and math functions are available as well as matrices and local and global variables.

Media/data import: Multimedia Toolbook offers a variety of media types, all of which are supported by Multimedia Windows. Dynamic Link Libraries are available to read and write dBase files, and the product imports and exports text

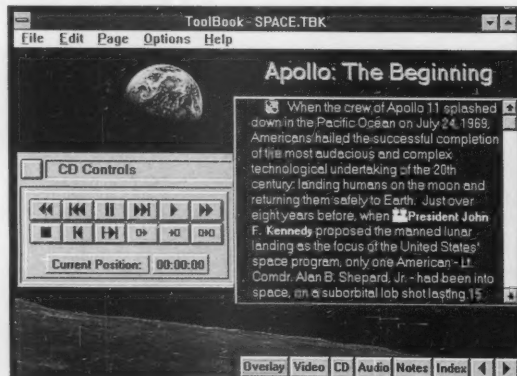
as fixed-field, delimited-field or unformatted ASCII files.

Animation: *PC Magazine* found Multimedia Toolbook's ability to manipulate simple animation tasks weak, citing the absence of facilities needed to transfer a bit-mapped image around the screen. *InfoWorld*, however, said users can produce extensively animated graphic elements using Multimedia Toolbook's basic vector drawing tools or imported bit maps.

Support: Forty-five days of free but not toll-free telephone support is provided.

Overall value: Despite a few minor drawbacks in animation and documentation, reviewers said Multimedia Toolbook is a bargain at \$695. It is loaded with features; for example, it provides more than 250 clip art examples called widgets that perform cut-and-paste multimedia functions.

Summary by Lisa Davidson.



Multimedia Toolbook supports all standard programming constructs

Quick. Think of a company that's sold \$6 billion more in UNIX systems than IBM.



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AT&T ACCUNET Fractional T45 Service offers co-routed interoffice channels, minimizing differential delays,

improving throughput and providing faster transmission.

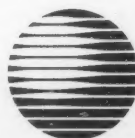
And as with all AT&T network services, Fractional T45 Service is supported by FASTARSM—the exclusive technology that gives AT&T a nationwide, self-healing network that can automatically bring circuits back up in minutes.**

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Technology information flows from the U.S. to Asia all the time.

David Kahaner's job is to move information the other way.

NUMERICAL ANALYSIS, COMPUTING AND HIKING in the mountains of Japan are the passions of David Kenneth Kahaner, a mathematician and supercomputer buff who is arguably the one person in the world most in touch with the global status of high-performance computing. He is a senior scientist at the U.S. Office of Naval Research (ONR) in Asia. He joined ONR in 1989 on four-year leave from the National Institute of Standards and Technology (NIST), where he was group leader and supervisory mathematician at NIST's Computational and Applied Mathematics Division.

Kahaner's job at ONR is to do competitive assessments of science and technology throughout Pacific Asia, with a special emphasis on computing, including computer-integrated manufacturing, artificial intelligence and fuzzy logic. His beat spans nearly half the globe, ranging from Australia to India and including Japan, Korea, Taiwan and China.

Though based in Tokyo, Kahaner spends much of each year traveling to other Asian countries, where he talks to scientists, researchers, academics and program directors involved in high-level computer projects.

The copious reports Kahaner writes on his findings (he has produced more than 200 during his three years at ONR) are disseminated to thousands of U.S. government personnel, scientists and industry leaders and are published regularly by forums ranging from the Institute of Electrical and Electronics Engineers, Inc. to The New York Times.

In addition to his duties at ONR, Kahaner serves as the Asian program chairman of the

world's largest annual supercomputing conference, which attracts more than 5,000 professionals from around the globe.

Kahaner spoke recently with David Kellar, Tokyo correspondent at the IDG News Service, in Japan. (Kahaner's views are his own and do not represent those of the U.S. government.)

Q: In the three years you've been at ONR in Japan, what has made the strongest impression on you?

A: I am now convinced it is very important that we continue to be aware of what's going on in computing in this part of the world. Not only in Japan but in many parts of Asia.

I just came back from India, where I had the opportunity to visit a very active massively parallel computing project that most people are not really aware of.

Other countries are making rapid advances as well. The People's Republic of China, for example, has a supercomputer project in which they're building hardware similar to early Cray machines.

Generally speaking, Asia is very active.

Q: What are the areas of strongest activity in computer research in Japan, and in what areas are the Japanese ahead of the U.S.?

A: The Japanese are very good at building devices. They are excellent at building things that people then buy. All of the high-end computer technology developed in the last few years in Japan has been essentially built upon their excellence in device technology.

At the device level, I think it is safe to say that what the Japanese are doing is at least comparable, if not superior, to what we are doing in the U.S.

Look at the major Japanese supercomputer vendors: Their products are — technologically speaking — very, very advanced.

David Kahaner, page 74



Vital stats: David Kahaner

Personal

Born in 1941 in New York. Married, two children.

Education

- B.S. (cum laude), Mathematics/Statistics (1962), City College of New York.
- M.S., Mathematics (1964) and Ph.D., Applied Mathematics (1968), Stevens Institute of Technology.

Significant accomplishments

- Developed VolksGrapher, the only public domain Fortran callable graphics package, combining ease of use and interactive capability.
- Researched, designed and implemented the Plotted Solutions of Differential Equations (Plod) numerical analysis system, a central part of research studies of dynamical systems, epidemiology and chaotic behavior. Awarded U.S. Department of Commerce silver medal in 1988 for his work on Plod.
- Climbed Mt. Fuji, 1991.

David Kahaner

CONTINUED FROM PAGE 73

But building a supercomputer is not just a matter of building hardware. It's a very complicated process with a lot of system software and integration — both physical integration and system integration. Those areas are not as advanced in Japan. U.S. companies are several years ahead of them in those aspects.

While the Japanese are very, very advanced in the areas of hardware development, they are a little behind in issues related to system software, application software, total machine throughput, etc.

Q: Some have said that single-CPU performance will top out as early as the middle of this decade. Do you think Japan will lose out when the emphasis switches from simple hardware performance to overall system performance?

A: Well, what's happening is that U.S. high-performance computer vendors are looking at other models such as parallelism and distributed computing to try to improve performance. The U.S. is ahead [of Japan] because it has a lot of experience in this area. Already, several products have appeared.

The Japanese are more conservative. They are watching and doing quite a lot of prototype work [in

50 years — is simply not true. At least I haven't seen it. There are plenty of advanced research projects, but they are small projects with just a few people.

Q: What are your views on the Japanese government's latest high-performance computing project — the Real World Computing Program? [The Real World Computing Program is a 10-year project launched in 1992 for advancing use of massively parallel computing, neural networks and optical computing technologies in future systems.]

A: You can think of the [Real World Computing] project as a successor to the Japanese government's Fifth-Generation Computer project.

The Fifth-Generation project was very useful for Japan because it educated a tremendous number of young Japanese scientists in fairly advanced ideas, such as knowledge processing. Perhaps that was one of its most important successes. The concrete accomplishments of the project are maybe not quite as important as these harder to quantify things.

If the same thing happens with this sixth-generation project, then the project will, I think, help propel Japanese science to a more advanced state.

The concrete things they are hoping to do, such as build a million-processor parallel processing computer, are in my opinion not tremendously outrageous. After all, you can go out today and buy a machine having 256,000 processors. So it is not so unreasonable to say that in 10 years you're going to have a design for a million-processor machine.

Probably the most important thing to be gained from this project will be to bring Japanese research stature to a more world-class level.

Q: So you think the Japanese government's intentions in internationalizing the Real World project are driven more from a desire to educate Japanese researchers than from outside pressure to open up?

A: This is one way of trying to immerse themselves in the international community, and I think they have a real desire to make a contribution. The technical originators of this project feel they have identified a problem that is important for the world, and they would like to try and make contributions. They feel Japanese scientists are as intelligent and creative at that level as their Western counterparts.

The place where the U.S. has difficulties with the project has to do with the development of high-level technology. We worry in the West that we're ahead in certain technological areas and that cooperating with the Japanese in this project will lead to a movement of that technology from the West to Japan.

Q: The Japanese seem to be leading in the area of creating a high-speed communications infrastructure based on the Integrated Services Digital Network (ISDN) standard. Do you see this as an area in which Japan might have an edge in the future?

A: Well, if things go forward on the schedule and at the pace that the Japanese have planned, I think they will have a tremendously impressive communications infrastructure. But I've heard recently that the pace is perhaps being slowed down because subscribers for ISDN have not signed up in the numbers the Japanese telephone industry had anticipated.

One thing I noticed is that Japanese companies have been working on the development of products associated with ISDN and broadband ISDN. So when that infrastructure comes to fruition, it would seem that the Japanese will have a very good start.

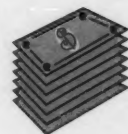
This is not to say, however, that there is not also substantial investment in this area being carried out in the U.S.

Q: Can you pinpoint any misperceptions that people in the U.S. have about Japanese technology?

A: One thing that maybe should be corrected is the seemingly widespread belief that Japanese cannot

Where the money goes

Of the ONR's \$360 million last year, 60% went to university professors who do basic research in the ONR's key areas of interest: oceans, materials and information technologies.



write software. I have been asked repeatedly whether the Japanese can write software, and I really can't understand why anyone would ask that question, as if there is some sort of genetic predisposition to being able to write programs. I just don't understand it.

The Japanese are using advanced software techniques, some of which were developed in the U.S.

What you maybe don't see here are these clever new software products that are forever appearing in the U.S. But big software projects are a different matter because they are more like an engineering activity, relying on tremendous cooperative organizational and management techniques more than insight and brilliance. I think the Japanese are perfectly capable of doing that. And the use of Unix, which is now spreading as a platform on which so many things are being developed, is going to help.

Q: Do you see any major differences in focus on high-level computing and high tech in the U.S. and Japan?

A: In the U.S., I get the impression that the way high-end computing has been developed — especially re-

From war to business machines

David Kahaner on the shift in the U.S.' focus from military to more commercial applications for high-level computer technology:

"I think that probably over the last five years, and even more so in the last two or three years, there has been an accelerated effort to move away from weapons into other applications for computing. First of all, the Cold War has diminished, or at least the pressure has diminished. Second of all, industry has observed that high-performance computing is very important. We see the use of very advanced computers in some prosaic industries.

"I was told just last month when I was in the U.S. that American Express has bought two very advanced parallel computers. That type of organization is about as middle-of-the-road as you can get. So I think you've got a combination of a diminution of emphasis on weapons and a recognition from other parts of industry that they can do some productive work with advanced technology."



David Kahaner: "The Japanese are very good at building devices. They are excellent at building things that people then buy."

this area], but they don't have any commercial products yet. They are behind; there is no question about that. But not decades behind — just a few years.

Q: Do you think there is more emphasis on long-term research in Japan than in the U.S.?

A: Japanese industry places much more weight on research than U.S. industry does. In the U.S., universities and the large government laboratories play a key role in fundamental research. In Japan, the universities and government laboratories do play a role, but that role is relatively small. Industrial research laboratories play a greater role, and they tend to be more practically oriented.

Some of the projects are fairly long-term in nature, but the long-term ones tend to be pretty small. The image that we have in the West — that you can go into some Japanese company and see 500 people working on some project that will come to fruition in

cently, with parallel computing — is that vendors think about some new architecture or a new design, attempt to build hardware and then go out looking for customers.

In Japan, however, the emphasis seems to be on building to a particular application rather than building something general.

Now as I said before, the Japanese are behind us and don't have any commercial products yet; they only have prototypes. But their prototypes have almost exclusively been developed by starting out looking at a particular class of applications and developing hardware for those applications. That makes it much easier to sell what you've got because you've immediately got a user.

Q: What are your goals?

A: I think one of the reasons the Japanese, and Asians in general, seem to be doing very well relative to us is that they have a lot of information about what is going on in the U.S.

We're not doing nearly so well at keeping abreast of what's going on in Asia. Statistics prove this. There are tremendously more Asian scientists and students who come to the U.S. and Europe to go to conferences, to study, to work, etc., than go in the other direction. In fact, the numbers are so imbalanced that unless we do something, there's going to be a constant net flow of information out of the U.S. to Asia.

It is very important to try to improve the science information "pipe" from Asia back to the U.S., and I have a personal goal of trying to do that. I've started here at ONR, and I think what I've done has been very effective. But it needs to be continued. •



Did you know?

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Computer Careers

Training in the age of downsizing

By Emily Leinfuss

As companies shave or completely cut training budgets, information systems departments — and the employees in them — are seeking cheaper and more effective ways to keep technically up to date. The advent of technical training vehicles such as computer-based training and other media-based instruction enables technical professionals to continue their technology education without losing job time or breaking the company's bank. Increasingly, companies are also using in-house experts as instructors.

LPC, a Pitney Bowes subsidiary that produces mainframe-based mail processing software, last year established a first-of-its-kind, in-house training department to address the needs of new employees and give systems professionals a chance to increase their skills.

Donna Hahn, LPC's training consultant, says it is economical and effective to rely on peer experts to share their knowledge through on-the-job training, offer a library of media-based training or bring formal training in-house.

In setting up classes, Hahn addresses employee needs. If there is a demand for CICS training, for instance, she finds a resident expert in CICS to conduct it.

Ben & Jerry's Homemade, Inc. in Waterbury, Vt., also brings specific courses in-house if there is enough employee in-

terest. For example, Christine McClary, manager of system development, plans to hold a train-the-trainer course and a project management course.

Some companies take a more informal approach. LPC, for instance, hosts brown-bag lunches to show educational videos. In-house experts attend so they can answer questions. Hahn says these group events are motivational and instructional. Group sharing of information may even have a higher value than individual instruction, she adds.

McClary agrees. "It is very helpful as we sit in a room as an entire department and get into discussions about how course material relates to our environment," she says.

Channing Jackson, director of technical control at Capital Cities, ABC Television Network Group in Hackensack, N.J., also finds that approach effective. He says productivity increases when employees are trained by and with peers. Employees are sent off-site for training and then share what they learn with the staff. "You send two people out to a class and they become the gurus."

Some companies also provide computer-based training facilities that systems staff members can use to augment their technical skills. LPC's training room, where employees come for instruction in such subjects as technical training and career planning, is set up with CD-ROM

and laser disc players. By taking a computer-based training course and asking questions of more learned staffers, Kelly Hradeck, a programmer/analyst at LPC, taught herself IDMS.

Steven Lute, an LPC senior software developer, prefers the self-paced aspect of computer-based training. "Often, it was difficult to find time to fit training into my schedule. With video-based train-

ing I can take it home and learn without having to take time away from the office," he says. He recently learned CICS this way.

Jackson says that bringing training in-house is obviously cheaper, but systems and application training is essential to the outcome of a project. He has turned to on-the-job training to assure that systems will be built by people who have the appropriate knowledge.

He also recognizes his staff's need to keep their skills current for the sake of their careers. "The world of technology is constantly changing," Jackson says.

Soft skills

While technical education lends itself to tangible forms of training, soft skills, such as learning to prosper in a political corporate culture, may be best learned from a mentor, says Howard Piggee Jr., an IS business manager at Corning, Inc. in Corning, N.Y.

Mentoring is individually targeted, spontaneous and reactive, Piggee says. Having a mentor offers him the chance to get feedback on his work experiences, he says. "As the dynamics of a situation change, I can get in touch with my mentor and talk over the issues."

Piggee's mentor, whom he meets with monthly, is Harvey Shrednick, vice president of information services at Corning.

Needs assessment

But what kind of training do systems people need? Hahn goes straight to the source. Every year she conducts a training needs analysis where senior managers evaluate their staffs' training needs. Additionally, she allows IS staff to suggest course topics.

At ABC, management decides how to spend training money, and it is strictly project and job related.

Of course, these companies are active in working with systems employees to meet training needs, but if your company cannot do it for you, you can do it for yourself.

"MIS professionals need to figure out their career path, and if their company is not giving formal training, they should try to get on-the-job training from a peer or learn by self-study," says Elliot Masie, executive coordinator at the Association for Computer Training and Support.

Leinfuss is a free-lance writer in Sarasota, Fla.

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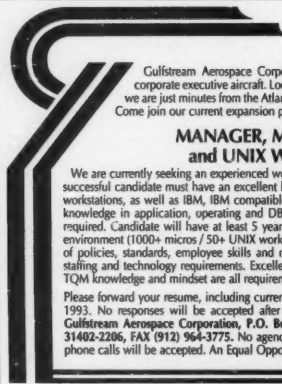
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Career advice for the '90s

Where to find descriptions of IS jobs



Fast Track is a twice-monthly column dedicated to answering questions on career directions.

This week's guest adviser is Jim Parker, a senior recruiter at Technical Connections, Inc., a Los Angeles executive search firm that specializes in placing computer professionals.

Q: Where can I find job descriptions for information systems positions? I work for an IS department at a bank. We want to have our people properly classified so they can be paid according to industry standards. To give you an idea, I manage four networks, but I'm still listed as a PC specialist because that's the closest description our human resources department has.

A: The Bureau of Labor Statistics publishes salary data by job category but at a fairly high level. Local user groups will often conduct salary surveys that include job descriptions. Nationwide IS recruiting firms also distribute similar information with a regional orientation.

In addition, many companies are beginning to publish very specific job descriptions in compliance with the Americans with Disabilities Act. Perhaps you could locate a company that has done this successfully and would be willing to help you create your own descriptions.

Q: I was laid off from a programming job more than five years ago. I found a comparable position two months later and have worked steadily in IS ever since. I find, however, that my involuntary termination can be a problem during interviews even today. What can be done to present this circumstance in the best light?

A: The previous stigma of having been laid off is quickly vanishing. Your best approach is to tell the hiring manager that your company had to let staff go because of its financial situation. A good manager should recognize this as a 5-year-old situation and concentrate on your more recent experience.

Q: I am over 50 and have more than 25 years of computer operations management experience with on-line transaction processing and mid-range IBM systems. What are my chances of gaining a similar management position?

A: In general, your prospects should be quite good. The advent of the Application System/400 opened management opportunities considerably. These machines have become integral to client/server configurations and departmental computing and as PC file servers. Additional skills in disaster recovery, downsizing and telecommunications can also be invaluable.

Q: I am a senior analyst at a large Northeast bank. I have been trying to get a similar job in another state but without much success. How can I improve my chances?

A: Trying to relocate in the current economy is difficult. Besides not knowing the local companies, you're viewed as an outsider.

Carefully evaluate your commitment to such an important move. You'll want to fully research the company and the community you are considering. Have solid reasons for why you are leaving your current job/home. Understand that you may have to undergo a salary adjustment to reflect differences in the cost of living. Make an extended trip to the new area to be available for interviews. Finally, don't expect the new company to pay your relocation expenses because it would increase your cost and will make you less attractive.

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Secrets for getting into management fast

■ Business skills increase your value because you can use technology to benefit the business — specifically, total quality management and being adept and understanding the ins and outs of client/server technology. You also need to be able to understand process re-engineering and have a business background (courses) to show that you're not just a specialist in programming or open systems, but you're more well-rounded.

Thomas Charbonneau, 31, manager of corporate information services/business administration Bose Corp., Framingham, Mass.

■ I worked in finance, sales and logistics in technology-type roles. I think getting cross-functional experiences has absolutely helped me get here this fast. In the past, people frowned on leaving your discipline and going somewhere else. But everything we're doing is becoming so cross-functional, that that has helped me the most.

Wayne Shurts, 33, director of logistic systems, Nabisco Foods Group, East Hanover, N.J.

■ I worked hard and did whatever was asked of me. I was at a large vendor corporation where there were a lot more management opportunities. I got to visit a lot of customer locations and see many computer shops. I think a vendor background is the best training you can get to see all aspects of the business.

George Thomas, 44, senior vice president and director of data processing, New York Clearing House Association, New York

What kind of tips would you like to read about? Call your ideas in to Kelly Sewell, assistant editor, features, at (508) 879-0700.



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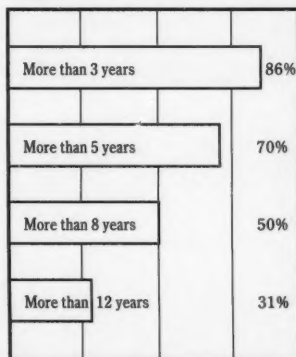
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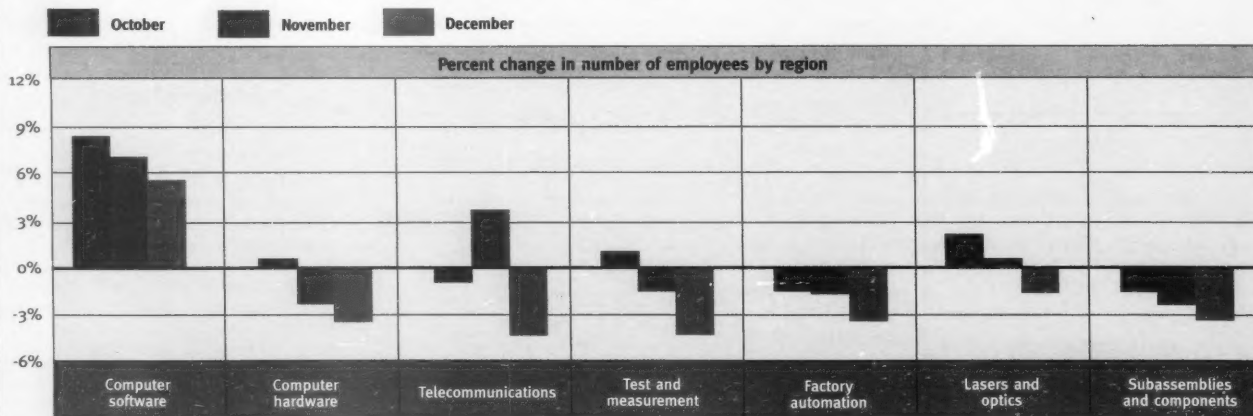
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Computerworld/CorpTech Career Index

Except for computer software, most industries cut numerous jobs during the month of December



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Marketplace

Veterans tell how to avoid bad buys



By Alice Bredin

We all make bad purchases from time to time, but the last thing you want to do in these bottom-line-conscious days is spend thousands of dollars on something you won't use.

One way corporate buyers deal with buying compulsions is through worksheets, which are step-by-step evaluations that weed out the "must-haves" from products destined to become "shelfware." Here, three veteran buyers share their purchase worksheets.

> Goal: To buy products that add to the business.

Buyer: Morris Enyeart, assistant vice president of systems architecture at The Continental Insurance Co. in Neptune, N.J.

- ✓ **Is there a need within the organization?** Look at the business to determine if it can be improved, enhanced or substantially changed by automation. If it can, the product is a candidate for further study.
- ✓ **Does the product fit within the business needs and the existing systems architecture?** Some buyers are lured by whatever has the best features at the time. Shop with an architecture, business environment and a long-term plan in mind.
- ✓ **Is the product compatible with existing systems, and can it be integrated?** The answer to both questions must be yes.
- ✓ **Does the product help the business?** It must add to the bottom line by increasing productivity or eliminating the need to use outside resources.

> Goal: To ensure the product fits into the firm's architecture and pertains to real user needs.

Buyer: Joel Martin, manager of client access services and information technology planning at Bose Corp. in Framingham, Mass.

- ✓ **Define components of the product architecture.** Explicitly state what the company wants to buy.
- ✓ **Map what the company has in that area now.**
- ✓ **Identify missing or weak component areas.** For example, a department may have an item that everyone in the department doesn't like.
- ✓ **Make priorities.** Talk to people in business units about the problems they have.
- ✓ **Select an evaluation expert to try several products.** Have someone devote at least 25% of their time to evaluating products.
- ✓ **Create "light" definitions of product requirements: Don't spend too much time on product requirements.** Instead, keep it general. For example, indicate only that the software must run on an Apple Computer, Inc. Macintosh.
- ✓ **Select and acquire evaluation products.** Narrow the field to three or four products based on the company's requirements and evaluate them.
- ✓ **Run pilot projects.** Bose's pilots involve 10 employees using a product for six to eight weeks. At the end of the pilot, participants discuss whether the product fits the company's needs and ease-of-use criteria.
- ✓ **Add to your list.** If the product meets requirements, it is added to the standards list and recommended for purchase.

Products too large and expensive to be evaluated with the worksheet are decided on at the executive level.

> Goal: Long-term product viability.

Buyer: Murray Stein, director of Point-Source Communications, a Prescott, Ariz., consultancy.

- ✓ **How well does the product interact with existing products?** For instance, look for products that have the ability to move a text document into a graphics package, as well as those that encode and move documents easily.
 - ✓ **Multiplatform support.** Applications must run well on PCs, Macintoshes and workstations. Most important questions: Can documents be loaded without changes across platforms? How much will memory be impacted?
 - ✓ **Upgrade path.** Make a practice of buying families of products to ensure compatibility.
 - ✓ **Time on market.** Before buying, carefully consider how long a product has been on the market. No one will fire you for buying Lotus, but if you are buying new material, at some point a product is going to fail.
- Minimize risk by purchasing only from small companies that make a strong support effort, such as offering technicians' home numbers.
- ✓ **Support.** Measure support in terms of hours and extra features. Check all support lines to verify quality of service. For critical products, look for purchase contracts that include extra support such as media updates, electronic mail and fax communications.

Bredin is a free-lance writer based in New York.

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PS/2 Model 60	\$600	\$450
PS/2 Model P70	\$1,200	\$1,500
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Compaq Portable II	\$425	\$275
Portable III	\$500	\$350
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SLT-286	\$650	\$650
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DeskPro 386/33	\$1,650	\$1,375
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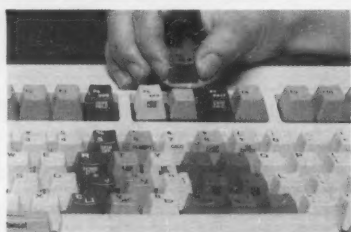
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Automation Research Systems, Ltd.
Alexandria, VA (703) 824-6400
CIS Technologies, Inc.
Tulsa, OK (918) 496-2451
Collaborative Medical Systems, Inc.
Newton, MA (617) 964-7880
Computer Methods Corp.
Livonia, MI (313) 522-5187
Continental Healthcare Systems, Inc.
Overland Park, KS (913) 451-6161
Cycare Systems, Inc.
Scottsdale, AZ (602) 596-4300
DFM Systems Inc.
West Des Moines, IA (515) 225-6744
First Data Corp.
Charlotte, NC (704) 549-7000

General Computer Corp.
Twinsburg, OH (216) 425-3241
Healthcare Services
Melville, NY (516) 293-4111
InfoMed, Inc.
Princeton, NJ (609) 987-8181
Instrumentation Laboratories
Lexington, MA (617) 861-0710
Interleaf, Inc.
Waltham, MA (617) 290-0710
Keane, Inc.
Boston, MA (617) 241-9200
Kurzweil Applied Intelligence, Inc.
Waltham, MA (617) 893-5151
Management Systems Associates
Raleigh, NC (919) 851-6177
Medaphis Physician Services Corp.
Atlanta, GA (404) 319-3300
Medic Computer System, Inc.
Raleigh, NC (919) 847-8102
National Medical Computer Services, Inc.
San Diego, CA (619) 566-5800
PHAMIS, Inc.
Seattle, WA (206) 622-9558
Poorman-Douglas Corp.
Portland, OR (503) 245-5555
Prime Clinical Systems, Inc.
Pasadena, CA (818) 449-1705
Professional Health Care Systems, Inc.
Los Angeles, CA (213) 578-7000
Serving Software, Inc.
Minneapolis, MN (612) 623-4038
Source Data Systems, Inc.
Cedar Rapids, IA (319) 393-3343
Synetics Corp.
Wakefield, MA (617) 245-9090
Versys, Inc.
Westwood, MA (617) 461-6400
Carl Zeiss, Inc.
Thornwood, NY (914) 747-1800

INSURANCE

Agena Corp.
Seattle, WA (206) 525-0005
Agency Management Services, Inc.
Norwell, MA (617) 982-9400
Delphi Information Systems, Inc.
Westlake Village, CA (818) 706-8989
Input Output Computer Services, Inc.
Waltham, MA (617) 890-2299
Insurnet, Inc.
Emeryville, CA (510) 652-3771
ISI Systems, Inc.
Andover, MA (508) 682-5500
Sigma Imaging Systems, Inc.
New York, NY (212) 476-3000
Strategic Data Systems, Inc.
Sheboygan, WI (414) 459-7999

IMAGING

Burns Consulting Group
Scituate, MA (617) 982-1888
Laser Recording Systems, Inc.
Mountain Lakes, NJ (201) 402-9500

LIBRARIES

CLSI, Inc.
Newtonville, MA (617) 965-6310

MANUFACTURING

Ask Computer Systems, Inc.
Mountain View, CA (415) 969-4442
Bell Atlantic Software Systems, Inc.
Sudbury, MA (508) 443-7311
Data 3 Systems
Santa Rosa, CA (707) 528-6560
Dlog Remix
Anaheim Hills, CA (714) 282-6422
Expandable Software, Inc.
Santa Cruz, CA (408) 261-7880
GE Consulting Services, Inc.
Rockville, MD (301) 340-5100

Matra Datavision, Inc.
Tewksbury, MA (508) 640-0940
Micro-MRP
Foster City, CA (415) 345-6000
Racal-Redac, Inc.
Westford, MA (508) 692-4900
Software Horizons, Inc.
Burlington, MA (617) 273-4711
SPECTRUM ASSOCIATES
Woburn, MA (617) 932-0932
Symmetrix, Inc.
Lexington, MA (617) 862-3200
The Peak Technologies Group, Inc.
Columbia, MD (410) 992-9922
Waters
Marlboro, MA (508) 624-8450

MANUFACTURING SOFTWARE

Effective Management Systems
Milwaukee, WI (414) 359-9800
North Coast Automation, Inc.
Cleveland, OH (216) 473-3800

NETWORKING

A-net
Eugene, OR (800) 444-9796

RETAIL

Comtek Systems, Inc.
San Antonio, TX (512) 340-8253
Concept Systems, Inc.
Philadelphia, PA (215) 563-1425
Data Management Facility Co., Inc.
Inwood, CA (818) 813-1620
Dataserive, Inc.
Eden Prairie, MN (612) 829-6000
Datatec Industries
Fairfield, NJ (201) 808-4000
Retail Store Systems, Inc.
Warwick, RI (401) 732-3323

SECURITY

Z-Lock Mfg. Co.
Redondo Beach, CA (310) 372-4842

SOFTWARE DEVELOPERS

Cadre Technologies, Inc.
Providence, RI (401) 351-5950
Stepstone Corp.
Sandy Hook, CT (203) 426-1875
Vanguard Software
Hudson, MA (508) 562-7711

SCHEDULING/PLANNING

Summit Solutions, Inc.
Chesterton, IN (219) 929-4189

TRAINING

Carl A. Argila, Ph.D., Inc.
Los Angeles, CA (800) 347-6903

TRANSPORTATION SOFTWARE

KCI/The Traffic Manager
Ft. Lauderdale, FL (305) 587-2270

UTILITIES

Kaye Instruments, Inc.
Bedford, MA (617) 275-0300
OASIS Technology, Inc.
Oxnard, CA (805) 988-1020

WHOLESALE DISTRIBUTION

Daly & Walcott, Inc.
W. Warwick, RI (401) 823-8400
Dynamic Data Systems, Inc.
Westminster, CO (303) 426-6048
Arthur Ellingsen & Co.
Arlington Heights, IL (708) 506-0555
National Distributor Systems, Inc.
Stratford, CT (203) 378-6010
SI Handling Systems, Inc.
Easton, PA (215) 252-7321

Companies in this issue

Page number refers to page on which story begins

A		L	
Action Technology, Inc.	43	Digital Enterprises, Inc.	33
Aldus Corp.	66,68	Digital Equipment Corp.	16,34,39,56,93
Alex. Brown & Sons, Inc.	92,93	Digital Research, Inc.	12
Altai, Inc.	48	Dollar Savings and Trust Co.	62
American Airlines	51	Dolphin Systems	44
American Express Co.	27,74	E	
American Heritage	6	Easel Corp.	15
American National Standards Institute	51	Eastman Kodak Co.	37
Analog Devices, Inc.	36	Eclipse Technologies	68
Andersen Consulting	6,57	Electronic Data Systems Corp.	51,57,94
Apple Computer, Inc.	1,2,6,22,34,36	Electronic Frontier Foundation	1
ASEA, Brown, Boveri	37,39,43,48,65,68,93	Electronics Industry Association	62
Associated Grocers, Inc.	12	Empire Financial Group	4
Association for Computer Training and Support	77	Everex Systems, Inc.	33
Asymetrix Corp.	68,70	F	
Alex, Inc.	6	Federal Bureau of Investigation	43
Atlas Ventures	93	FileNet Corp.	92
AT&T	1,27,36	First Chicago Corp.	93
Attain Corp.	37	Forbes	6
Autodesk, Inc.	68	Forrester Research, Inc.	1,12
B		Forum for Distributed Object Computing	51
Banyan Systems, Inc.	12,16,93	Free Software Foundation	51
Bay Partners	93	Fujitsu Personal Systems Ltd.	36
BCE, Inc.	93	Furman Selz, Inc.	1,4
Bell Atlantic Corp.	1	G	
Bell Canada	93	Gartner Group, Inc.	27
Ben & Jerry's Homemade, Inc.	77	General Motors Corp.	94
Bessemer Venture Partners	93	General Networks, Inc.	39
Beyond, Inc.	16,93	Glynn International, Inc.	33
BIS Strategic Decisions	36	Gold Disk, Inc.	68
B. J. Cassin	93	Goldman, Sachs & Co.	93
Boeing Computer Services	51	Gordon Capital Corp.	93
Boole & Babbage, Inc.	16	Grace Horn Ventures	93
Borland International, Inc.	1,2,14,16,48,94	Greylock Management	93
British Telecom	94	Gupta Corp.	2
Byer California	1	Gygnus Support	51
C		H	
Cadence Design Systems, Inc.	51	Halliburton Industries	62
Caldor Corp.	6	Hambrecht & Quist, Inc.	4
Canon Ltd.	93	Harvest Foods, Inc.	58
Capital Cities	77	Hewlett-Packard Co.	1,4,6,8,39,43,48,93
CDS, Inc.	6	Highland Capital	93
Chipcom Corp.	6	Hughes Hubbard & Reed	48
Chrysler Corp.	93	Hughes Information Technology Co.	51
Cisco Systems, Inc.	12	Hughes Network Systems, Inc.	1
Citibank NA	51	I	
Citicorp	93	IBM	4,6,15,16,22,27
C. J. Lawrence, Morgan Grenfall, Inc.	14		34,37,39,49,54,69,93,94
Claris Corp.	12,36,69	IMRS, Inc.	92
Communication Intelligence Corp.	36	Inference Corp.	27
Communications Network Architects, Inc.	1,12	Information Systems Security Association	43
Compaq Computer Corp.	94	Information Builders, Inc.	56
Computer Associates	16	Integrated Systems Solutions Corp.	57,94
Computer Intelligence	16	Intel Corp.	69
ComputerLand Corp.	94	Intergraph Corp.	6,39,93
Computer Security Institute	34	International Data Corp.	39,47
Computer Support Corp.	68	International Communications Association	1
Consolidated Edison Co.	36	User Group	16
Coral Network Corp.	12	International Trade Commission	16
Corel Systems Corp.	68	J	
Cornerstone Ventures	93	J. Baker, Inc.	6
Cornerstone Software, Inc.	2	James Martin Insight	77
Corning, Inc.	77	Jamesway Corp.	6
Corporate Facilitators of Object-Oriented Technology	51	JAS Technologies of the Americas, Inc.	33
CostCo	94	JYACC, Inc.	2
CRSS Architects, Inc.	4,8	K	
CSC Index, Inc.	57	Kaiser Permanente	57
D		Kmart Corp.	1
Dairy Queen	40	KnowledgeWare, Inc.	10,15
Data General Corp.	1,93	KPMG Peat Marwick	57
Datapro Information Services Group	93	L	
Dataquest, Inc.	43,93	LaBarge, Inc.	57
Deere & Co.	8	Laser Magnetic Storage	47
D. H. Brown Associates, Inc.	8	International, Inc.	47
DHL Airways, Inc.	51	Leprechaun Software International Ltd.	33
		Lotus Development Corp.	6,8,34,36
			39,48,65,66,68,69,94
		M	
		Loyola University	62
		LPC	77
		N	
		Macromedia, Inc.	68
		Management Horizons	1
		Marcam Corp.	92
		Marshall, Inc.	16
		Mastech Systems Corp.	22
		Mastersoft, Inc.	37
		Mateys Corp.	15
		Matrix Partners	93
		May & Speh, Inc.	57
		McCaw Cellular Communications, Inc.	93
		McDonnell Douglas Corp.	57
		MCI Communications Corp.	20
		Meritor Savings Bank	57
		Merrill Pickard, Andersen & Eyre	93
		MicroAge	94
		MicroEdge	51
		Microelectronics and Computer Technology Corp.	1
		Micrograph, Inc.	68
		Microsoft Corp.	1,2,6,12,14,34
			37,39,65,66,68,69,70,93
		Mips Technologies, Inc.	8
		Mitsubishi Electric Corp.	49
		Motorola, Inc.	36,93
		O	
		National Science Foundation	74
		National Semiconductor Corp.	36
		NCR Corp.	4,47
		NEC Corp.	36
		Network General Corp.	43
		Network Systems Corp.	47
		Neuron Data, Inc.	2
		New Enterprise Associates	93
		New York Clearing House Association	47
		New York Life Insurance Co.	6
		Next, Inc.	6,93
		Novell, Inc.	6,16,12,34
			39,43,47,93
		P	
		Oak Ridge National Laboratory	12
		Object Management Group	51
		Oracle Corp.	2
		Q	
		Pacific Gas & Electric Co.	1
		Patricia Seybold Group	51
		Pen Pal Associates, Inc.	36
		Pennie & Edmonds	48
		Pensoft Corp.	36
		Personal Computer Memory Card International Association	36
		Phibro Energy, Inc.	93
		Pillar Corp.	93
		Pitney Bowes, Inc.	77
		Pizza Hut International	36
		PMA Reinsurance Corp.	16
		PMI Food Equipment Group	43
		POC-IT Management Services, Inc.	37
		Potters Bank and Trust Co.	62
		Powersoft Corp.	2,15,93
		Preston, Thorgirson, Shidler, Gates and Ellis	48
		Price Waterhouse	1,39
		Proteon, Inc.	16
		R	
		Retix	16
		R. S. Tipton, Inc.	4
		Rutgers University	12
		S	
		Sabre Computer Services	51
		Schindler Elevator Corp.	1
		SCM Office Supplies, Inc.	4
		Shaw, Pittman, Potts & Trowbridge	57
		SHL Systemhouse, Inc.	93
		Sierra/Alliance, Inc.	47
		Silicon Graphics, Inc.	8,39,93
		Smith College	62
		T	
		Softswitch, Inc.	16
		Software Alliance Corp.	6
		Software Publishing Corp.	65,66,68,69
		Spinnaker Software Corp.	68
		Sprint Corp.	20
		SQ Software, Inc.	2
		SRI International, Inc.	1
		State University College	62
		Sun Microsystems, Inc.	1,4,6,8
			34,39,93
		Symantec Corp.	37
		Syquest Technology	6
		U	
		Tandem Computers, Inc.	2
		Technology Investments Strategies Corp.	2
		Texaco, Inc.	8
		Texas A&M University	22
		Texas Instruments, Inc.	33
		The Burton Group	12
		The Chase Manhattan Bank NA	1,94
		The Chicago Corp.	92
		The Dun & Bradstreet Corp.	68
		The Santa Cruz Operation	6
		The Traveler's Corp.	62
		Trinity Ventures	93
		Trio Information Systems	37
		TRW, Inc.	12
		V	
		Union Bank of Switzerland	43
		Union Gas	8
		Unisys Corp.	28,34,47
		Unix System Laboratories, Inc.	12
		US West	20
		US West Advanced Technology	51
		W	
		Versant Object Technology Corp.	54
		Viewpoint Systems, Inc.	15
		Viking Freight System, Inc.	2
		X	
		Wal-Mart Stores, Inc.	1,43
		Wang Laboratories, Inc.	2
		Western Data Systems	57
		Western Digital Corp.	33
		WordPerfect Corp.	8,39,68
		Y	
		Xavier University	62
		Xerox Corp.	22
		Z	
		Zenographic, Inc.	68

Computerworld's Friday Stock Ticker

Gainers

Percent

SPINNAKER SOFTWARE	63.9	GROUP I SOFTWARE	-20.6
SOFTWARE PUBLISHING CORP.	42.9	BACHMAN INFO. SYSTEMS	-19.0
ZODUS INTERNATIONAL LTD.	40.6	WALKER INTERACTIVE SYSTEMS(L)	-18.3
CREATIVE TECHNOLOGIES INC.	38.1	EXABYTE	-17.6
MICROIMAGE INC.	28.2	TANDEM COMPUTERS INC. (H)	-17.4
GENERAL DATA COMM. INDS. (H)	25.9	SYSTEM SOFTWARE ASSOC.	-16.1
COMPUTER ASSOCIATES	25.3	EASEL CORP.	-14.8
MECA SOFTWARE	20.4	SIERRA SEMICONDUCTOR	-14.4

Dollar

CREATIVE TECHNOLOGIES INC.	9.25	BMC SOFTWARE INC. (H)	-3.50
COMPUTER ASSOCIATES	5.38	SYSTEM SOFTWARE ASSOC.	-3.50
CISCO SYSTEMS INC. (H)	5.13	AUTODESK INC.	-3.38
SYNOPSIS COMMUNICATIONS (H)	4.88	SYNOPSIS	-3.25
ADAPTEC INC.	4.50	WALKER INTERACTIVE SYSTEMS(L)	-3.25
ORACLE CORP.	4.13	GROUP I SOFTWARE	-3.25
INTELLIGENT INFO. SYSTEMS (H)	4.00	EXABYTE	-3.13
NETWARE NETWORKS CORP. (H)	3.88	XEROX CORP.	-3.13

Buy on weakness

Despite fourth-quarter difficulties for several companies in 1992, analysts say they like the stock market prospects for some industry firms. If their stock prices dip in response to disappointing quarterly reports, these issues can present good investment opportunities.

FileNet Corp. (FILE)

FileNet's preliminary report indicated revenue of \$35 million, a full \$9 million below average Wall Street expectations, according to The Chicago Corp. The revenue shortfall resulted in a \$5 million net loss.

In a Jan. 11 report, analyst Robert Johnson said the difficult economy makes it hard to anticipate when the imaging company will turn the situation around. Johnson also noted that a poor quarter has historically presented a good purchasing opportunity in FileNet's stock, though the current situation is worse than in previous instances.

In light of FileNet's forthcoming products (including a low-cost pilot imaging system), solid gross margins and good competitive positioning, The Chicago Corp. maintained a Buy rating on FileNet issues. FileNet closed last Thursday at 15.

IMRS, Inc. (IMRS)

Business-reporting software vendor IMRS projects fourth-quarter revenue of \$14 million, again below Wall Street's expectations. Management attributed the shortfall to the failure to close several large deals that nonetheless remain in the pipeline. The company's product mix is in transition, with the Microsoft Corp. Windows-based Hyperion report writer contributing an increasing portion of revenue.

Both The Chicago Corp. and Alex. Brown & Sons, Inc. rated IMRS stock as a Buy in reports issued Jan. 11. Since then, however, the stock's price has tumbled from about 20 to 15 1/4 at Wednesday's close. IMRS regained 1 1/4 Thursday to finish at 16 1/2.

Marcam Corp. (MCAM)

Several factors contributed to a disappointing quarterly report from Marcam, according to a Jan. 12 report from Alex. Brown. Slow domestic unit sales of Marcam's software were matched by increased international unit sales but at lower margins. The company also absorbed unexpected expenses related to the acquisition of IBM's Mapics product.

Alex. Brown downgraded Marcam from Strong Buy to Buy. The stock closed Thursday at 20 1/4.

—Derek Slater

EXCH	52-WEEK RANGE	Jan. 22	Wk Net	Wk Pct	EXCH	52-WEEK RANGE	Jan. 22	Wk Net	Wk Pct
		3PM	CHANGE	CHANGE			3PM	CHANGE	CHANGE
COMMUNICATIONS AND NETWORK SERVICES									
OTC	34.38	9.63	3 COM CORP. (H)	34.38	3.38	10.9	OTC	19.75	10.25
NYS	74.50	56.25	AMERICAN INFO TECHS CORP.	74.50	0.13	0.2	OTC	21.38	9.50
NYS	54.50	36.63	AT&T (H)	54.50	0.00	0.0	OTC	22.75	28.75
OTC	4.25	0.75	BELL SOUTH CORP.	4.25	0.19	10.3	OTC	23.25	13.00
OTC	24.50	10.25	BANYAN SYSTEMS INC. (H)	24.50	-0.25	-1.0	OTC	22.25	5.25
NYS	53.88	40.25	BELL ATLANTIC CORP.	53.88	-0.13	0.2	OTC	43.75	27.25
NYS	89.75	62.13	BELLSOUTH CORP.	89.75	2.75	3.2	OTC	20.50	6.50
NYS	6.75	3.63	BOLT, BERANEK & NEWMAN	6.75	-0.38	-5.6	OTC	95.00	65.50
OTC	17.25	10.00	BROOKTRUST TECHNOLOGY	17.25	1.60	9.3	OTC	33.75	12.00
OTC	30.75	17.50	CHIEF CORP.	30.75	1.00	3.4	OTC	23.50	11.25
OTC	93.50	33.00	CISCO SYSTEMS INC. (H)	93.50	5.13	5.8	OTC	11.00	3.50
OTC	29.75	5.50	COMPRESSION LABS INC.	29.75	0.00	0.0	OTC	25.50	25.25
OTC	3.38	0.88	DATASWITCH CORP.	3.38	0.06	2.5	OTC	61.50	29.00
NYS	23.63	13.75	DIGITAL COMM. ASSOC.	23.63	-0.38	-1.9	OTC	24.50	3.13
OTC	14.75	7.50	DIGITAL SYSTEMS INT'L INC.	14.75	-0.38	-2.6	OTC	22.75	4.00
OTC	26.50	4.00	DSC COMMUNICATIONS (H)	26.50	3.25	14.0	OTC	17.25	3.63
OTC	10.88	4.75	FIBROX INT'L INC.	10.88	-1.25	-14.3	OTC	27.75	8.50
OTC	37.50	10.50	FILNET CORP.	37.50	-1.25	-7.7	OTC	26.25	6.75
OTC	4.38	1.50	GANDALF TECHNOLOGIES INC. (H)	4.38	-0.06	-1.4	OTC	8.88	2.00
OTC	2.25	0.69	GENEAL COMMUNICATIONS	2.25	-0.06	-2.7	OTC	16.50	3.25
NYS	9.13	2.88	GENERAL DATA COMM. INDS. (H)	9.13	1.88	25.9	OTC	7.25	0.75
ASE	5.88	1.63	GO VIDEO	5.88	-0.13	-2.2	OTC	16.50	3.25
NYS	35.75	28.88	GTE CORP.	35.75	-0.13	-0.4	OTC	25.25	13.75
NYS	74.38	57.13	ITT CORP. (H)	74.38	3.25	4.5	OTC	25.50	8.00
OTC	43.38	29.50	MCI COMMUNICATIONS CORP. (H)	43.38	-0.75	-1.8	OTC	54.75	21.00
OTC	14.25	2.25	MICROMED INC.	14.25	-0.50	-3.5	OTC	49.75	5.88
OTC	20.50	12.00	NETRUM CORP.	20.50	0.50	2.9	OTC	5.25	1.50
OTC	16.75	9.63	NETWORK COMPUTING DEVICES	16.75	0.00	0.0	OTC	25.50	11.84
NYS	18.25	8.13	NETWORK EQUIPMENT TECH.	18.25	0.50	2.7	OTC	13.25	2.50
OTC	25.50	8.00	NETWORK GENERALS	25.50	-0.75	-2.9	OTC	23.75	13.75
OTC	17.63	8.50	NETWORK SYSTEMS CORP.	17.63	0.25	1.3	OTC	4.38	1.38
OTC	48.13	10.88	NETWARE NETWORKS CORP. (H)	48.13	3.88	8.8			
NYS	49.25	30.50	NORTHERN TELECOM LTD.	49.25	-1.25	-2.5			
OTC	35.50	22.50	NOVELL INC.	35.50	-0.63	-1.7			
NYS	88.50	69.13	NYNEX CORP.	88.50	-0.63	-0.7			
OTC	37.50	14.50	OCTEL COMMUNICATIONS CORP.	37.50	1.00	2.7			
OTC	9.38	3.38	PENRIL DATA COMM NETWORKS	9.38	0.75	15.8			
OTC	53.00	10.25	PICTURETECH CORP.	53.00	1.00	3.5			
OTC	18.75	7.00	PICTURETECH CORP.	18.75	-0.50	-2.6			
NYS	29.38	10.16	SCIENTIFIC ATLANTA INC. (H)	29.38	1.88	6.8			
NYS	75.63	56.63	SOUTHWESTERN BELL CORP. (H)	75.63	-1.88	-2.5			
OTC	15.13	20.75	SPRINT CORP.	15.13	0.50	3.3			
OTC	27.00	7.25	STRATACOM MICROSYSTEMS CORP.	27.00	-2.75	-11.0			
OTC	17.25	6.88	STRATACOM INC. (H)	17.25	0.50	3.0			
OTC	91.88	18.75	SYNOPSIS COMMUNICATIONS (H)	91.88	4.88	5.6			
OTC	7.13	4.38	TELENET CORP.	7.13	-0.25	-3.5			
OTC	24.25	13.38	US ROBOTICS	24.25	0.75	3.3			
OTC	40.00	32.88	U.S. WEST INC.	40.00	-1.25	-3.1			
OTC	46.00	12.00	WELLCOMTELE COMMUNICATIONS (H)	46.00	0.50	1.1			
OTC	22.00	7.00	XEROX CORP.	22.00	0.00	0.0			
PC'S AND WORKSTATIONS									
OTC	10.00	3.13	ADVANCED LOGIC RESEARCH	10.00	-0.38	-3.0			
OTC	10.00	41.50	ALPHACORP INC.	10.00	-1.50	-2.4			
OTC	24.25	11.25	AST RESER. INC. (H)	24.25	-1.63	-6.8			
NYS	17.75	6.13	COMMODORE INT'L	17.75	0.88	13.7			
OTC	25.13	22.75	COMPAC COMPUTER CORP. (H)	25.13	0.88	3.3			
OTC	48.38	15.00	DEL COMPUTER CORP.	48.38	-0.13	-0.3			
OTC	7.75	0.25	EVERETT SYSTEMS INC.	7.75	0.00	0.0			
NYS	38.63	26.63	HARRIS CORP. (H)	38.63	-1.25	-3.4			
NYS	85.00	50.25	HENWELL PACKARD CO.	85.00	-0.13	-0.2			
NYS	33.00	14.13	SHILKOW SYSTEMS (H)	33.00	3.50	11.9			
OTC	49.50	23.50	SUN MICROSYSTEMS INC. (H)	49.50	1.00	2.0			
NYS	32.13	22.25	TANDY CORP.	32.13	-0.88	-4.4			
NYS	11.13	5.00	ZENITH ELECTRONICS	11.13	-0.25	-2.2			
OTC	25.50	2.75	ZODUS INTERNATIONAL LTD.	25.50	1.63	6.6			
LARGE SYSTEMS									
ASE	20.63	6.63	AMAND CORP.	20.63	0.00	0.0			
NYS	16.38	4.75	CONVEY COMPUTER	16.38	-0.10	-1.9			
OTC	9.50	1.88	CRAY COMPUTER	9.50	0.25	2.6			
OTC	46.50	19.00	DATA GENERAL CORP.	46.50	0.00	0.0			
NYS	13.00	7.13	DATA GENERAL CORP.	13.00	1.13	8.7			
NYS	65.50	30.38	DIGITAL EQUIPMENT CORP.	65.50	1.00	1.4			
NYS	100.38	45.88	IBM	100.38	0.13	0.3			
OTC	19.50	5.00	KENDALL SCIENCE RESEARCH	19.50	0.00	0.0			
NYS	117.75	83.00	MATSUSHITA ELECTRONICS	117.75	0.75	0.9			
OTC	17.50	6.00	NETSCAPE TECHNOLOGY	17.50	-1.25	-7.1			
OTC	22.88	11.13	SEQUENT TECHNOLOGY	22.88	0.88	3.9			
OTC	16.38	1.13	SEQUIA SYSTEMS INC.	16.38	-0.13	-0.8			
OTC	54.25	29.50	STRATUS COMPUTER INC.	54.25	-3.50	-6.5			
NYS	16.88	9.88	TANDAM CORP. INC. (H)	16.88	-0.88	-5.2			
NYS	12.88	7.00	UNISYS CORP. (H)	12.88	0.63	5.1			
ASE	7.50	0.06	WANG LABS INC. (H)	7.50	0.06	14.2			
SOFTWARE									
OTC	65.75	25.25	ADAPTEC INC.	65.75	4.50	11.1			
OTC	36.25	10.25	ALPACORP INC.	36.25	0.00	0.0			
OTC	19.75	7.00	AMERICAN SOFTWARE INC.	19.75	0.13	0.6			
OTC	25.25	9.25	ASC COMPUTER SYSTEMS INC.	25.25	-0.63	-2.5			
OTC	56.50	23.25	AUTODESK INC.	56.50	-3.88	-6.9			
OTC	37.75	3.75	BACHMAN INFO. SYSTEMS	37.75	-1.00	-2.6			
OTC	43.00	34.00	BGS SYSTEMS INC.	43.00	2.00	5.1			
OTC	44.13	17.25	BMC SOFTWARE INC. (H)	44.13	-3.50	-8.3			
OTC	25.50	16.50	BOOLE & BARRAGE	25.50	-0.50	-2.2			
OTC	82.50	17.50	BORLAND INT'L INC. (L)	82.50	1.00	1.2			
OTC	10.50	3.38	CE SOFTWARE (L)	10.50	0.38	3.8			
ASE	34.75	9.38	CHEYENNE SOFTWARE INC. (H)	34.75	-0.13	-0.4			
OTC	11.75	8.25	CHIPSORT	11.75	-0.50	-4.3			
OTC	11.88	5.63	CODING INC.	11.88	0.25	2.1			
NYS	26.63	10.88	COMPUTER ASSOCIATES	26.63	5.38	25.3			
NYS	12.58	4.00	COMPUTERVISION CORP.	12.58	-0.25	-2.0			
OTC	18.50	6.75	COMWARE INC.	18.50	-1.25	-6.8			
OTC	46.50	6.00	EASEL CORP.	46.50	-1.00	-2.2			
OTC	26.50	11.75	FRANK TECHNOLOGY	26.50	-1.88	-7.1			
OTC	25.00	12.50	GROUP I SOFTWARE	25.00	-1.25	-5.0			
OTC	7.88	3.50	HOGAN SYSTEMS INC. (H)	7.88	0.25	3.3			
OTC	25.75	13.75	IMRS INC.	25.75	-1.50	-5.7			
OTC	36.25	18.50	INFORMATION RESOURCES	36.25	-1.25	-3.8			
OTC	38.25	11.00	INFORMIX CORP. (H)	38.25	1.25	3.4			
OTC	21.38	11.00	INTERGRAPH CORP.	21.38	0.00	0.0			
OTC	15.00	7.75	INTERLEAF INC.	15.00	-1.13	-7.5			
SEMICONDUCTORS									
NYS	21.50	7.38	ADVANCED MICRO DEVICES	21.50	-0.38	-1.9			
NYS	17.25	8.63	ANALOG DEVICES INC.	17.25	0.00	0.0			
OTC	14.00	5.00	ATMEL CORP. (H)	14.00	-0.50	-3.6			
OTC	14.13	3.25	CHIPS AND TECHNOLOGIES	14.13	-0.38	-2.7			
NYS	16.88	7.38	CYPRESS SEMICONDUCTOR CORP.	16.88	1.00	9.2			
OTC	7.00	2.00	DALLAS SEMICONDUCTOR	7.00	-0.50	-7.1			
OTC	118.00	46.50	INTEL CORP. (H)	118.00	1.00	0.9			
NYS	11.88	4.88	LSI LOGIC CORP. (H)	11.88	0.13	1.1			</

Computer Industry

Next to cool black box, push OS

By James Daly
REDWOOD CITY, CALIF.

In
Brief

PowerSoft files IPO

Client/server tool start-up PowerSoft Corp. last week filed an initial public offering (IPO) with the Securities and Exchange Commission. The company hopes to sell 1.8 million primary shares and 65,000 secondary shares. The Burlington, Mass., company expects the initial per-share price to range from \$14 to \$16.

Beyond raises cash

Beyond, Inc. has attracted \$6.6 million in equity financing from a group of investors that includes Banyan Systems, Inc. and Novell, Inc. Also participating in the Cambridge, Mass., electronic-mail vendor's third round of financing were new investors Trinity Ventures, Greylock Management and Highland Capital, as well as existing investors Matrix Partners, Merrill Pickard, Andersen & Eyre, New Enterprise Associates and Atlas Ventures.

BCE to sell SHL stake

BCE, Inc. will sell its 22% stake in SHL Systemhouse, Inc. for roughly \$65 million under an underwriting agreement with Gordon Capital Corp. BCE and SHL last June scrapped a proposed partnership in which the Montreal-based parent of Bell Canada would have increased its stake in the Ottawa systems integrator to 60%. In return, SHL would have gained access to BCE's extensive data centers.

SHORT TAKES Pillar Corp., a Foster City, Calif., developer of budgeting software, has received \$2 million in additional venture capital.... **Frame Technology Corp.** in San Jose, Calif., has agreed to acquire Verity, Inc. in Mountain View, Calif. Verity makes a text-retrieval server engine. Frame is a supplier of electronic publishing software.

Next, Inc., the workstation maker launched with great fanfare by Apple Computer, Inc. co-founder Steve Jobs in 1985, is once again doing what it does best: struggling.

Key products are late, and at least six top executives have departed during the last year. However, analysts and developers said 1993 should see a major transmogrification of the Next game plan. By year's end, Next is expected to shift away from its powerful but slow-selling workstations and over to its flashy object-oriented operating system, NextStep — a technological gem that analysts have always considered the company's crown jewel. Next officials were unavailable for comment.

Why the shift? Jobs' plan of putting a "best of breed" sleek black cube of a workstation on the desktops of corporate America is just not working. This failure follows an equally unsuccessful strategy of targeting the machine exclusively at the university market.

The Motorola, Inc. 680X0-based Next models initially impressed many with a bevy of breakthrough technologies, such as a slick user interface and its ease of crafting custom applications. However, it was hobbled by a lack of wide-ranging business software, compatibility issues and the delayed introduction of the final operating system. The machines, moreover, have not come close to matching unit volume shipments of market leaders Sun Microsystems, Inc. or Hewlett-Packard Co.

RISC in the wings

Next may be circling the wagons in the hardware department, but it is also planning a May introduction of a reduced instruction set computing-based workstation. Some said the new model will not make much of a difference for the bottom line at Next and is one more symbol of Jobs' hardware fixation.

With the commoditization of the hardware market, it may be increasingly difficult for Next's sales force to make a case for their sleek

black cube. "The Next machine is nice, but it's by no means unique," said Ken Anderson, a senior program analyst and Next user at Philbro Energy, Inc. in Westport, Conn.

NextStep, on the other hand, is different. The well-regarded operating system sports a sterling interface and is being touted as a great platform to develop sophis-

cant financial obstacles in selling NextStep 486 to PC users. In addition to shelling out \$995 for the user version of NextStep 486, extra circuit boards, memory and disk drive capacity may be needed to bring a typical PC up to the sophisticated color, sound and video capabilities of the Next machine — adding several thousand dollars to the cost of the machine.

But analysts do not expect NextStep 486 to work miracles. "I really think the NextStep interface is the best on the market, but what are you going to run on it?" asked Dataquest analyst Paul Cabbage. "There are only a handful of applications around for it and the rest you'd have to develop internally. Next is still fighting years of corporate standards."

Meanwhile, Next has already chewed up some \$200 million in funding from Japan's Canon Ltd. and Ross Perot — and even Jobs' own wallet. For now, Next has gained a little breathing room because it received an additional \$55 million line of credit from Canon.

Additionally, the executive-level hemorrhaging continued at Next this month when hardware chief and co-founder Richard A. Page left for personal reasons. Said a friend: "People get driven pretty hard by Jobs. They get burned out. Rich just had enough."

FINANCIAL UPDATE

Next

Next's revenue growth rate of 10% is more than double that of the workstation markets — 4.2%

Worldwide revenue

1991	\$127M
1992	\$140M

Source: Company reports

icated custom in-house applications. "NextStep is by far the best thing to come out of the company and the best operating system out there today," according to David Peter, founder and president of HSD, Inc., a Next software developer in Mountain View, Calif.

NextStep today delivers the kind of object-oriented environment that potential rivals such as Microsoft Corp.'s Cairo or Apple Computer, Inc. and IBM's Taligent systems cannot guarantee until mid-decade.

The company's secret weapon, however, is NextStep 486, which will run on the 2 million PCs that researcher Dataquest, Inc. estimates use Intel Corp. I486 microprocessors. Jobs has called NextStep 486 the "Trojan horse" that offers the widespread appeal to finally get his firm's foot firmly in the door of corporate America. "The head of our arrow is definitely pointed at NextStep 486," one inside source said.

But there have been delays. NextStep 486 was due last year, but working out the details regarding peripheral interoperability has proven tricky. It is now scheduled for release about midyear.

Would it disappoint users if Next were to become an operating system-only company? "Not in the least. They definitely should be an operating systems company," Anderson said. "That's where their strength is, and that's where the money is."

Next, however, still faces signifi-

In the ballpark

Insiders say Steve Jobs is a self-described "hardware junkie," who is still emotionally committed to and convinced of his machines' superiority. Indeed, some reports bear him out on this. In a recent Dataport Information Services Group survey of 2,370 workstation users, Next came in a close second in general use, only a notch behind HP's Model 700 and ahead of Sun's SPARCstation, the Iris workstation from Silicon Graphics, Inc. and models from IBM and Digital Equipment Corp. [CW, Aug. 10]. NextStep's power has already attracted orders for several thousand machines from companies such as Chrysler Corp. subsidiary Chrysler Financial, McCaw Cellular Communications, Inc. and First Chicago Corp.

1992 fourth-quarter earnings

Many technology companies ended the 1992 calendar year with a sour quarter

COMPANY	REVENUE	% CHANGE FROM SAME QUARTER 1991	NET INCOME	% CHANGE FROM SAME QUARTER 1991
Amdahl Corp.	\$744.9M	91%	\$2.5M	119%
The ASK Group, Inc.	\$113.5M	6.1%	\$3.6M	248%
AST Research, Inc.	\$346.3M	45%	\$14.6M	(13)%
Data General Corp.	\$279.6M	(5.2)%	\$800,000	(80)%
Storage Technology Corp.	\$414.3M	(13)%	\$(7.7M)	*
Symantec Corp.	\$48.7M	(15.9)%	\$(170,000)	*
Tandem Computers, Inc.	\$483.9M	6.5%	\$17.5M	118%
Unisys Corp.	\$2.26B	(8.4)%	\$139.2M	73%
Wellfleet Communications, Inc.	\$40.1M	110.7%	\$6.0M	54.3%

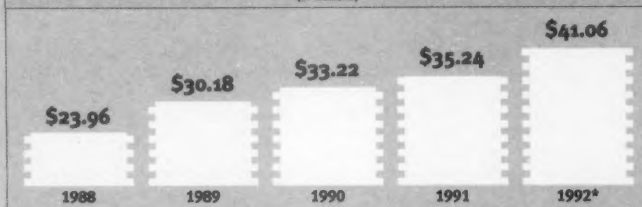
*Not meaningful

Source: Company reports

WELL SO-SO POOR

Industry Health Watch

WORLDWIDE SEMICONDUCTOR MARKET

Semiconductor sales
(in millions)

Source: Gartner Group Yardstick

**Estimated

Top 10 vendors by 1992 revenue
(in millions)

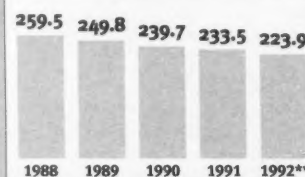
Intel Corp.	\$5.06
NEC Technologies, Inc.	\$4.98
Toshiba America Information Systems, Inc.	\$4.77
Motorola, Inc.	\$4.64
Hitachi Data Systems Corp.	\$3.90
Texas Instruments, Inc.	\$3.05
Fujitsu Computer Products of America	\$2.58
Mitsubishi Electronics Corp.	\$2.31
Philips Telecommunications N.V.	\$2.11
Matsushita Electric Industrial Co.	\$1.93

Source: Dataquest, Inc.

Revenue
(in billions)

	1991	1992
North American companies	\$22.9	\$26.9
Japanese companies	\$27.7	\$28.1
European companies	\$6.3	\$6.7
Asia/Pacific companies	\$2.7	\$3.9

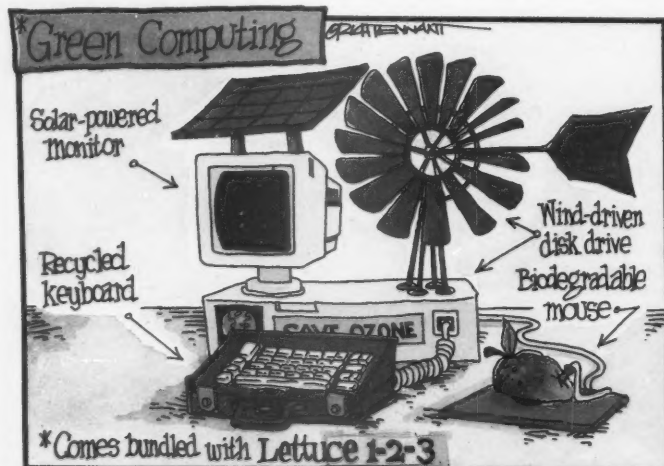
Source: Dataquest

Average number of employees industrywide
(in millions)

Source: U.S. Bureau of Labor Statistics

**CW estimate

The Fifth Wave



Inside Lines

Cashing in

Struggling General Motors may be getting ready to leverage the strength of its Electronic Data Systems outsourcing subsidiary to help get its financial house in order. Word is GM wants to sell a portion of EDS to obtain a much needed cash infusion. It apparently now has an interested buyer: the UK's BT. It's not clear if BT would purchase equity or if it would buy EDS stock, which is known as GM Class E (GME) and is based on EDS' performance. BT is believed to be considering a 20% to 25% share. GM now owns close to 60% of all GME. EDS would gain an outsourcing contract and access to BT's TimeNet network, sources said.

Much ado about nothing?

The *Wall Street Journal* touched off a brouhaha last week concerning alleged December 1992 merger discussions between Borland and Lotus executives. According to Lotus Senior Vice President Robert Weiler, Lotus CEO Jim Manzi approached Borland about possibly selling its database product line to Lotus. Nothing came of the discussion, which Borland CEO Philippe Kahn said included talks about Lotus' potential support for Integrated Database Application Programming Interface and the settling of an ongoing suit between the two companies. Last week, Kahn told a gathering of software executives at a meeting sponsored by the Massachusetts Computer Software Council that the *Journal* story "was a joke."

Small wonder

Why is IBM's financial management being closely scrutinized? Consider this: IBM outsourcing subsidiary ISSC is providing The Chase Manhattan Bank with 4,000 IBM PS/2s as part of the bank's MetroLan branch automation project. ISSC is providing the PCs at cost plus 3% to the Chase branches. However, because ISSC doesn't have the PCs in inventory and has to work through third-party distributors such as MicroAge and ComputerLand, it is paying list price for each PC that it sells to Chase. ISSC is thereby losing 15% on each unit sold, according to a source close to the project. However, the source said ISSC still stands to profit on the contract through networking and other services.

Getting small

Compaq is readying a salvo of products in the hopes of burnishing its newfound price leadership image. Besides new Centura notebooks, the company is expected to create a new line of PCs, which will be positioned below ProLinea and aimed at the mass market. Compaq officials hinted at the new line by saying they want to sell low-end products through discounters such as CostCo. Also on the Compaq agenda: a new laser printer targeted at individuals. This product will come PostScript-ready, print up to eight pages per minute and cost \$900.

Serving clients

Stop by the client/server conference in San Jose, Calif., this week: IBM is expected to announce software that enables OS/2 servers to act as distributed database and application servers, with APPN providing the connections and distributed resource directories. A "skinny client" announcement is also expected that would enable DOS and perhaps other types of clients to participate as nodes in APPN-based distributed applications.

"We don't make bombs; we're the friendly Union," explained Bob Bready, president of Unison Information Systems, an optical storage device manufacturer in Framingham, Mass. Last week, *Cable News Network* ran a story about the bombing of Iraq's Al Rashid Hotel in Baghdad. CNN said one of the bombs used in the raid was made by Unison Industries, an aircraft ignition manufacturer in Jacksonville, Fla. Shortly after the report, the Framingham-based Unison received calls from customers wondering whether there was a connection between the two companies. There isn't, Bready said. Phone, fax or CompuServe News Editor Alan Alper with news tips at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try Computerworld's 24-hour voice-mail tip line at (508) 820-8555.



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